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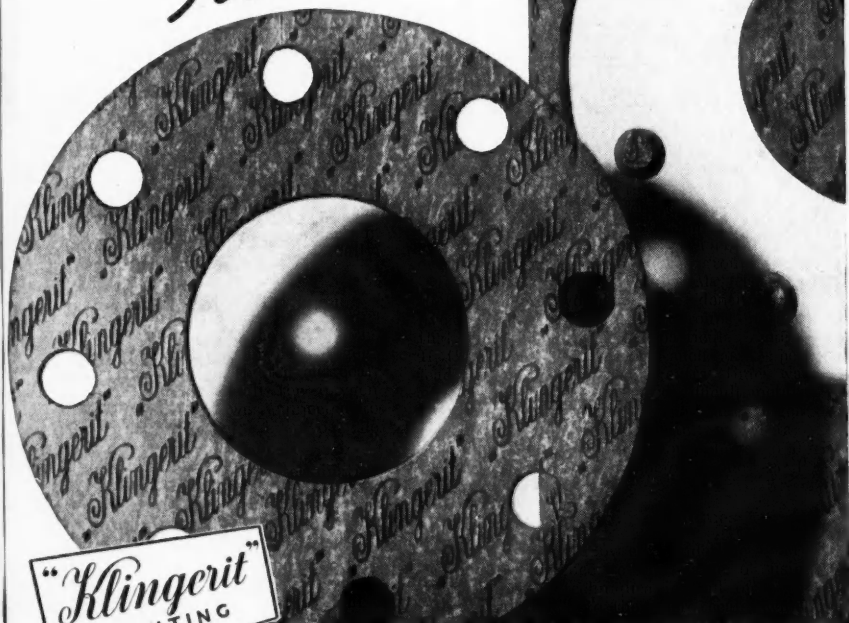
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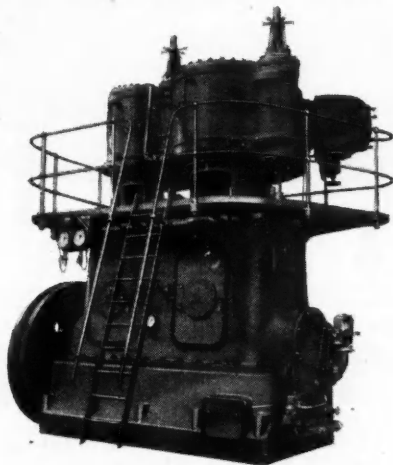
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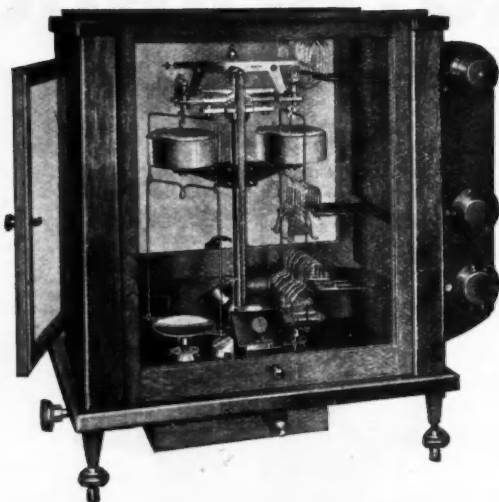
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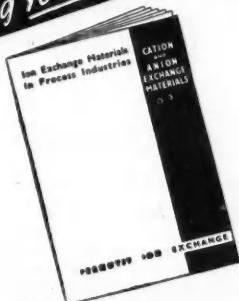
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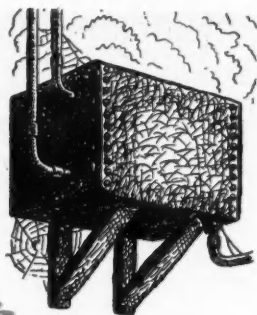
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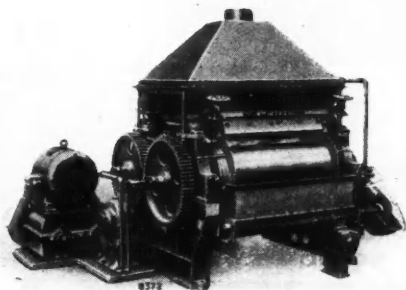
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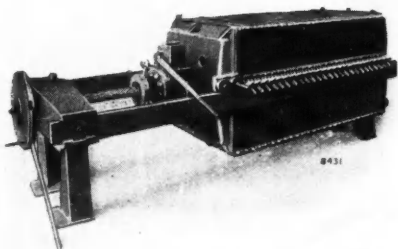
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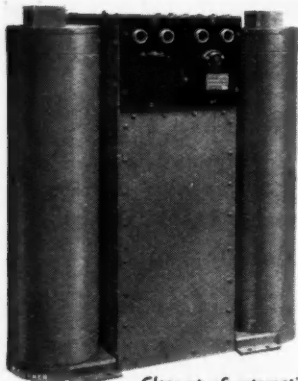
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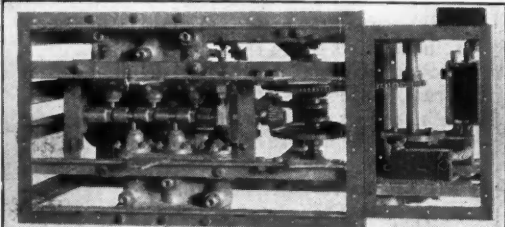
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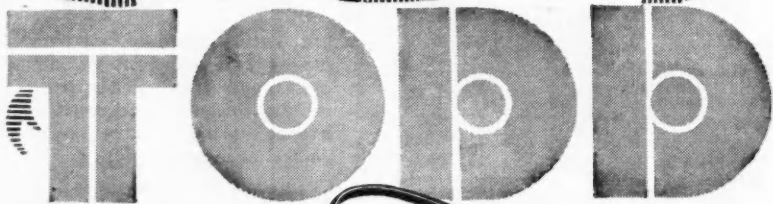
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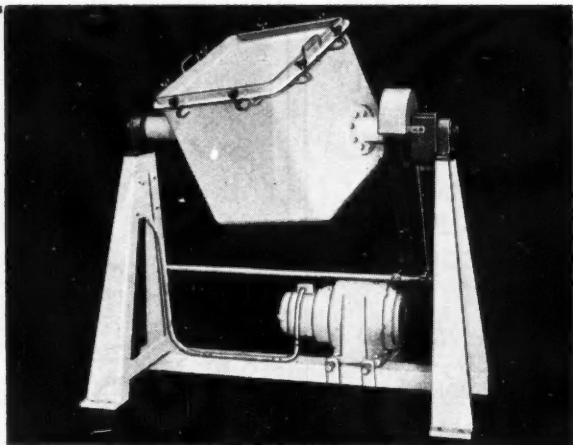
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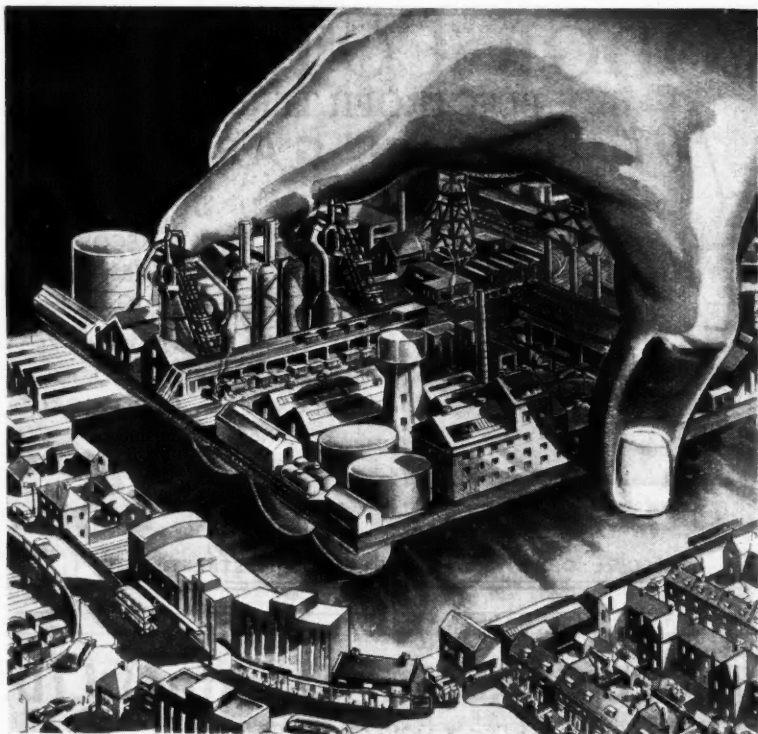
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Towards Nationalisation

THE certainty has long been apparent that the Government would have sooner or later to make some gesture in response to the few but insistent voices which have been calling for application of "the new order" to chemical industry. Now the desired acknowledgment has been made by the association of the President of the Board of Trade with the Labour Party and trades union private discussion of prospects of extending the nationalisation programme to take in chemical industry, or a convenient part of it. The distinguishing feature of these new approaches to an old and—in the past—singularly unprofitable theme has been the unanimous unwillingness of the planners and of those others likely to be most intimately concerned to see any open discussion of the issues at stake. From the standpoint of some trades union politicians that precaution is readily understandable. Their purpose is to secure at least a good approach, if possible with supporting fire from the Government, to an objective which has never before been susceptible to a direct attack.

The opinion is still widely held that the prospects of "socialising" any substantial portion of chemical industry are to-day as flimsy as they were when small scale propaganda to that end first began to be heard. It is certainly true that the emotional appeal which served well enough when there was no prospect whatever of

securing fulfilment of the dream of nationalisation has shed all its glow. In the interval a wide range of basic activities and their multifarious subsidiaries have come under the vitalising influence of State control and no one, excepting perhaps a very few privileged administering figures, has been a penny the better for it. The "consumer" has paid dearly and, what is far more disconcerting in the view of trade union objectives, occasion for discontent on the part of workers has often been accentuated. If the case rested there the advocates of nationalisation would not have chosen this moment to open a campaign, which is, of course, not confined to the recent discussion between Government officials and trades union officials. There is now, however, an entirely new and unprecedented situation created by the acquisition by the State of coal and gas and the firm intention to deal similarly with iron and steel—all of which are sufficiently closely interrelated to lend force to the implication that what is done to one is meet for all.

In recognition of all this, the Chemical Workers' Union has latterly performed some remarkable evolutions, contrasting sharply with its apparent independence in days gone by. A lively conflict for control of union policy appears to have ended in victory for those who may be thought to be most acceptable in Government quarters, and there have been other

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changes no less remarkable. Chemical industry is now being discussed in terms more reminiscent of some recent White Papers than of the old condemnatory spirit. (*The Chemical Worker*, 29, 8.) In fact, a general stocktaking has been attempted and the assets as a whole are admitted to be sound but underdeveloped. The transition from hearty trades unionism to the field of economics will suggest a lightning conversion only to those who do not recognise what is hopefully regarded as being the next step.

The view has lately been freely expressed that, whatever counsels may be proffered by the unions, any Government bid to found a new monopoly in chemical industry would be likely to aim first only at the acquisition of Imperial Chemical Industries, Ltd. While there is, of course, no official sanction for that belief, the CWU journal significantly singles out alkali production as "a monopoly of one great industrial establishment," alleging that insufficiency of caustic soda and soda ash has been caused thereby. "It is not necessary to travel far to seek a solution of this bottleneck," urges the CWU general secretary (Mr. Bob Edwards). "All monopolies tend towards the restricted output in the interest of high profits: the present shortage is due almost entirely to this factor." Statements of

that kind are, of course, common currency in trades union polemics and are offered more readily because it is not necessary to substantiate them.

Now it must have occurred to many that long avoidance of public discussion by those who alone are fully qualified to present the real facts about the aims and performance of this and some other equally vital sections of chemical industry has persisted too long. If, between now and the next General Election, a sectional bid subjects chemical industries—or some of them—to such ill-conceived reorganisation as is proposed for iron and steel the outcome may well rest with the electorate. It would be deplorable if the occasion found them as ill-informed as most were when the Iron and Steel Bill took shape.

To provide against such a contingency, action on some other lines is no less desirable. One of the factors giving strong encouragement to previous nationalisation projects has been the "cut-price" levels at which it has been possible to acquire industrial assets which, but for the voluntary limitation of dividends, would have commanded very different market values. Now, fortunately, many industries are recognising that this "gentleman's agreement" has been grossly abused and must be ended.

NOTES AND COMMENTS

Counting Assets

THE capacity for taking a buoyant view of the country's trade and economic affairs is not one of the gifts which flourish most under the influence of Ministerial surveys, threats, promises and the rest of the devices with which industry has been so liberally favoured. There remains fortunately a hard core of informed opinion which takes a longer view than seems visible to Government circles and is reassuringly unalarmed. One holding that solid standpoint, acquired in 50 years' experience in chemical industry, is Mr. H. E. Alcock, telling the Luton Chamber of Trade a few days ago: "For major manufacturing purposes we have coal, salt, limestone, chalk, sand and water. I know of no country better situated, with our nearby ports and shipping facilities, which could beat us on even terms of trade in commodities requiring a high degree of technical skill to produce them. That we have that skill is patent to all the industrial world, which has followed us in the development of industries in the last 50 years. In this connection I refer particularly to the U.S.A. and Germany. Recently I have visited both countries, and I have seen nothing to alter my opinion."

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THAT plain statement of our enduring assets is likely to be more convincing for most people than the more dramatic presentation—now promised by the Central Office of Information—of "the struggle for economic survival," past, present and future, in the form of a six weeks' exhibition in London (from March 21). "This," says the COI, "should provide a notable landmark in the education of the people in our vital national problem and how it should be resolved. . . . The state of the nation before the war, after the war, now and in 1952 when Marshall Aid ends will be simply and graphically displayed." There will be revolving stages, dioramas to drive home the lesson that increased production is indispensable, cartoon displays . . . in a word, all the fun of the fair. That analogy is not unjust. The preliminary publicity confides: "As an interesting novelty to simplify the story, the exhibition will include a 'fun fair,'

with such items as pin tables, distorting mirrors, Aladdin's Cave, a fortune-telling machine and the Biggest Rat out of Captivity." Just how all this is going to serve "the essential need for increased production of coal, iron and steel, ships, vehicles and rolling stock, textiles, chemicals and agriculture" is best left to the fortune-telling machine.

Alchemy

THAT the precursors of modern chemists were the alchemists of old is generally admitted and the fact lends to alchemy an added fascination. To that can be attributed the comparative abundance of publication about "the white art." Prof. John Read, of the Chair of Chemistry, St. Andrew's University, an acknowledged expert on the subject, in an address on "Alchemy and Alchemical Literature" to the Scottish centre of PEN in Edinburgh recently, recalled that alchemy was believed to have existed in China in the fifth century B.C., and reached its peak in England in the Middle Ages. It was, the professor said, a complex philosophical system embracing experimental science. Symbolism played a large part in alchemy and Prof. Read showed a number of designs in which sulphur and mercury, the elements which were thought could be blended to produce the philosopher's stone, were symbolised in different ways. The twilight of alchemy came with the publication by Robert Boyle in 1661 of "The Sceptical Chemist," although the art lingered on for more than a century. The fact that there is now an increasing demand for early books on the subject does not imply the existence of a revivalist movement—despite certain extraordinary trends in official science in the U.S.S.R.

Atomic Forecasts

EXTRAORDINARY difference of opinion continues to prevail as to how soon or how long it will be, before it becomes a practicable proposition to transmit atomic power into productive processes for industry. The U.S. General Electric Company recently announced the construction of a new reactor on a site a few miles from the Knolls atomic power laboratory

Production Teams

50 Tours in the U.S.A. This Year

FURTHER information has been given on the selection and activities of teams from British industries to visit the U.S.A. under the scheme organised by the Anglo-American Productivity Council.

During the first 12 months it is expected some 50 teams will be sent, and it is hoped to continue on a comparable scale for a second year.

Productivity teams will be formed on an industry basis. The primary object is to enable the widest cross-section of each industry to benefit. Selected teams should be able to carry out a series of visits to factories in the U.K. to obtain a comprehensive view before they leave for America. On return they will be expected to explain and discuss what they have seen and the views they have formed.

Each team will have a maximum of 15, normally allotted as follows. Four supervisory (to include works management and foremen); a minimum of four technicians, with additional number for appropriate industries; four from workshop levels (to cover operatives and shop stewards).

The total time occupied by such a tour, in this country and in the U.S.A., will be about 3½ months. Firms will be expected to pay normal salaries during the time involved. The British Government will make a grant of 50 per cent of sterling costs to the British section of the council; employers' organisations concerned will find the balance.

Mr. Kenneth J. Burton, of the British Employers' Confederation, has been appointed a joint secretary of the council in addition to Sir Norman Kipping (Federation of British Industries) and Mr. Vincent Tewson (Trades Union Congress).

NOTES AND COMMENTS

(Continued from previous page)

at Schenectady, the object being to study the generation of electric power from nuclear energy. Two new machines, a cosmotron and an electric furnace, built for the American Atomic Energy Commission indicate the rapid development of this branch of science. The experts, however, both in America and this country, on the whole speak either with the greatest reserve, or else in terms which suggest a good deal of pessimism. There is some reason for such views as Sir Claude Gibb's (to the North of England branch of the Institution of Mechanical Engineers)

Defence Research

Scientists and Services to Confer

AT the invitation of the Council of the Royal Society, a Defences Services Research Facilities Committee has been set up to "consider proposals for the use of Service facilities and personnel for assisting scientific research, and to make recommendations to the Council of the Royal Society, the Lords Commissioners of the Admiralty, the Army Council, and the Air Council."

The committee proposes to operate through panels of scientists and Service representatives who are specially interested in specific projects. At its first meeting panels were formed to cover the following subjects: Submarine gravity measurements, surplus explosives, magnetic survey, aerial photography, scientific expeditions. The members of the committee are:—

Chairman, Sir Geoffrey Taylor; Royal Society, Prof. P. M. S. Blackett, Sir Harold Spencer Jones, Dr. A. C. Menzies, Mr. F. S. Russell; Admiralty, Vice-Admiral A. G. N. Wyatt, Mr. F. Brundett; War Office, Lieutenant-General Sir Kenneth Crawford, Dr. O. H. Wansbrough-Jones; Air Ministry, Air Vice-Marshal C. E. N. Guest, Mr. G. S. Whittuck; Ministry of Supply, Dr. F. J. Wilkins, Mr. H. M. Garner.

Scientists wishing to submit proposals for consideration by the committee should communicate their suggestions in the first instance to the assistant secretary of the Royal Society.

BISRA Admits Associate Members.—The British Iron & Steel Research Association has created a new category of associate membership. Such members will be at liberty to attend the Association's technical conferences and will receive research reports.

that "a lot of nonsense" is being written about atomic energy. Mr. F. Harrod, the British economist (*THE CHEMICAL AGE*, 59, 682) considered the disadvantages associated with atomic fission so outweighed the potential benefits (excluding medical aspects), that he recommended a temporary standstill. Not the least problem of industrial use, would appear to be the protection of the worker or operator, and disposal of radioactive effluents. Meanwhile, so contradictory are the opinions relating to atomic power and so well concealed the facts, that no industry has yet found justification for making any provision for this great potential source of energy in its future programme.

Threat to U.S. Steel? Possibility of Government Control

THE remote possibility of the American steel industry being nationalised along British lines was mentioned by Irving S. Olds, chairman of the board of directors of the United States Steel Corporation in an address to the Manufacturers' Association of Hartford County, Hartford, Connecticut.

Defending the American industry's record in expansion, he quoted facts and figures about production and capacity, and strongly denied allegations that output was being kept down in order to maintain prices.

Many people in the United States, he said, apparently desired to have more Government intervention in business. Their opinion apparently was that public interest would be better served by statutes and arbitrary regulations by bureaucrats.

He urged U.S. industry to beware of "a foreign importation to replace our long tried-out system of competitive free enterprise."

Nationalisation in India

The Government's policy on nationalisation of industries in India was recently discussed by Dr. Mookerjee, the Minister for Industries. No further steps, he said, were contemplated for any industry other than those already under Government management and direction—Arms and ammunition, railways, and production and control of atomic energy. Principal responsibility for the development of new undertakings such as mineral oils, coal, iron and steel, was taken by the State.

Prodigal Coal Policy?

Speaking at Newcastle-on-Tyne at the annual meeting of the North of England branch of the Institution of Mechanical Engineers, Sir Claude D. Gibb, chairman of C. A. Parsons & Co., Ltd., Newcastle, suggested that Britain's exports of raw coal should cease. He advocated the setting up of processing plants in the coalfields so that only the chemical products of the coal should be exported, at a highly increased export value.

Although these ideas might be termed visionary, he said, vision or courage was needed to deal with the national problem—courage to look 50 to 100 years ahead.

He considered that "a lot of nonsense" had been written about atomic energy. It would be many years before atomic energy was able to compete economically with coal as a source of energy. Meanwhile, he believed that in less than 50 years coal output in Britain would be no more than 120 million tons a year.

Export Trade Survey Betro's Aid to Industry

IN a survey of the nation's progress and prospects last week, Sir Stafford Cripps, Chancellor of the Exchequer, stressed the problems that remained to be solved, laying emphasis on production for export.

The contribution being made by the British Export Trade Research Organisation to the enlargement of the export market was also underlined at a Press conference in London to review the work and development of the organisation during the past year.

More work and research had been carried out than ever before, reported Lt.-Col. H. A. P. Disney, director and secretary. The Middle East had been the centre of extensive investigation, particularly into markets for chemicals, plastics, paints, glues, glass, and mining machinery.

Mr. R. C. Taylor, who has just returned from an extensive tour of North Africa, gave to a CHEMICAL AGE representative some interesting sidelights on the problems of French Morocco.

French African Phosphate

The French, he said, were doing their utmost to develop the territory, which is rich in minerals. The phosphate mines at Khouribga and Louis Gentil have become one of the principal earners of foreign currency. The difficulties are trying to persuade the naturally conservative natives to adopt modern methods of agriculture, rotation of crops and use of chemical fertilisers, etc.

The production of molybdenum had been found not to be a practicable proposition, and the French company, Le Molybden, was now turning its attention to the copper pyrites from the Bouazzer mine and had a copper sulphate plant near Casablanca. The sulphate was being increasingly used as fertiliser for the vines.

PILKINGTON'S NEW INTEREST

THE acquisition by Pilkington Brothers, Ltd., of St. Helens, of a majority holding of the shares of James A. Jobling and Company, of Sunderland, was announced on Saturday last week. Pilkington's is the largest glassworkers in the U.K., and employs a capital of more than £3 million, and Jobling's has a long-established reputation as makers of laboratory, glassware and chemical apparatus, of which its productions of large-scale processing plant in Pyrex has commanded special attention in recent years.

German Oil and Potash

New Projects Retarded by Shortage of Plant and Capital

WITH the production of potash salts at a monthly rate of about 500,000 tons—equal to approximately 50,000 tons of K_2O —the potash industry in Western Germany is still unable to meet the whole of the domestic demand. Efforts are being made to extend existing plant and reopen idle works, but progress is slow, owing to lack of funds for investment and construction materials.

Housing Difficulties

Burbach, one of the leading producers, states that its efforts to obtain new capital have been unsuccessful, and more intensive use of existing plant is rendered difficult by shortage of housing accommodation for workers.

Both potash salts and sodium chloride, according to the Burbach management, could be shipped abroad in larger quantities at present world market prices and currency rates but for difficulties caused by JEIA restrictions. A big contract for salt was obtained from Sweden but was not carried out as it did not accord with the existing regulations.

The British zone mineral oil production last year increased by nearly 10 per cent, from 572,134 tons in 1947 to 628,989 tons; to this must be added about 5000 tons for the production of the French zone. The German crude oil output is still far from the wartime record of 1.06 million tons in 1940, but has nearly reached the 1946 out-

put of 642,629 tons. Last year's increase was achieved mainly as a result of the currency reform which facilitated the purchase of equipment and helped to raise working morale. In December the British zone crude oil output amounted to 58,493 tons, and further gains are expected this year as drilling operations were doubled in 1948.

Marked progress was made last year in the Emsland oilfields which contributed 26.8 per cent, against 20.0 per cent in 1947, to the total output. In this area, to which Holland is laying claim, increased production was reported from Emlichheim and Georgsdorf which, next to Nienhagen, are now the most important German fields.

Perlon Bristles

Perlon, the entirely synthetic fibre developed by I. G. Farbenindustrie just before the war, is now to be made on an experimental scale by Vereinigte Glanzstoff-Fabriken A.G. at Obernburg-on-Main; Perlon bristles are also to be produced. Perlon is at present made only in the Soviet zone of Germany.

J. P. Bemberg, A.G., is now operating its rayon factories at Wuppertal and Augsburg at 70 per cent of the 1938 rate, and since the currency reform has been able to show a slight profit. The manufacture of transparent sheets was resumed before the main works were reopened.

The Widening Range of Antibiotics

AN interesting survey of the development of antibiotics was given in London last week by Mr. F. A. Robinson at a meeting of the British Association of Chemists. The speakers recalled the history of penicillin from its discovery by Sir Alexander Fleming, and its subsequent development by Sir Howard Florey and Dr. E. Chain in 1940, to the modern deep culture methods developed in the U.S.A. He indicated the methods by which the chemical structure was elucidated, and the astonishing improvements in the therapeutic efficacy of the crystalline sodium salt of penicillin G, benzyl penicillin, compared with the earliest preparations.

Improved strains of penicillin have been obtained by selection and artificially induced mutations. Benzyl penicillin is

superior in therapeutic properties to penicillin K, which is *n*-heptyl penicillin.

Improved methods of injection have now been developed, the best of which is the sparingly soluble procaine salt in a vegetable oil.

The speaker also gave a brief review of some modern antibiotics, including streptomycin. The latter, he pointed out, affects a range of organisms quite different from penicillin, but it is not generally recommended in cases of pulmonary tuberculosis. Results should still be interpreted with caution.

The newest antibiotics include chlormycetin, which is being used against scrub typhus in Burma. Bacitracin is effective against whooping cough. Many new developments are anticipated.

MICRO-ANALYSIS

Its Application in the Oil and Colour Industry

By C. WHALLEY, B.Sc., A.R.I.C.

THE subject of micro-analysis was usually regarded as being within the province of the pure analyst and not so much within that of the applied analyst in industry, said Mr. C. Whalley, in an address on "Micro-Analysis in the Oil and Colour Industries," which he gave at a recent meeting of the London Section of the Oil and Colour Chemists' Association, held at Manson House, 26 Portland Place, W.1, at which Mr. David E. Roe (chairman of the section) presided. Those who were trying to push its application to industrial processes generally had had quite a large amount of success in a wide variety of industries, said Mr. Whalley.

A general description of the scope and development of micro-analytical methods was given by Mr. Whalley, who described some of the apparatus and some of the more common techniques used in micro-analytical methods, and discussed applications of certain of those methods and techniques to problems of interest to the oil and colour industries.

Micro-Chemical Methods

Micro-analysis, he said, was a very vague description. It could refer to the actual analysis of very small amounts of material. The chemistry of some of the radio-active elements, such as plutonium, had been worked out by micro-chemical methods, and full-scale plant was built from the information gained by micro-chemical analysis.

Another side, which was probably of more importance in industry, was the determination of small amounts or traces of material where the actual quantity available was not necessarily small, there being available sample weights of perhaps from half to one g. Micro-analysis was referred to loosely as being concerned with the determination of quantities of the order of from half to 10 g.; work on quantities from 10 to 100 mg. was referred to as semi-micro-analysis; and work on micrograms, i.e., millionths of a gram, was referred to as sub-micro-analysis.

To industry, semi-micro-analysis was of the greatest importance. The classification of micro-chemical methods was a big subject. It included the organic and inorganic side and the physical, chemical and other methods. He indicated some of the qualitative spot tests and some of the principal quantitative methods; he considered absorp-

tiometry or colorimetric methods to be the most important of all those.

Lots of things could be done on the micro scale, but in stepping up to full scale one frequently could not get things to work, for there might be absorption of ions, mixed precipitations, and so on. In general, however, stepping down could be done quite easily, simply by maintaining conditions precisely the same as in the micro method.

Micro-chemical methods were introduced first on the Continent; but in 1933 or 1934 the techniques were introduced into this country by Prof. Briscoe and Dr. Janet Matthews, who had lectured to the Royal Institute of Chemistry.

Neatness of Equipment

Discussing the factors which had contributed to the ever-growing interest in micro-chemical methods, Mr. Whalley said the first, which was perhaps not quite a practical one, was the fascination and neatness of the equipment and apparatus used. Secondly, a vast saving of space could be effected in industrial laboratories by the application of those methods, which was particularly important in laboratories where a large variety of materials had to be dealt with; results were produced of corresponding accuracy with those obtained when using older and larger equipment and, in general, in correspondingly less time. Another important advantage was the saving in the quantities of reagents used, which might be quite an economical proposition in large laboratories.

Manipulative Skill

Referring to the disadvantages of micro-analysis, he said it did require more careful work than one would devote to an ordinary macro determination, and it required a high degree of manipulative skill. There was no place in micro-analysis for the "ham-fisted" gentlemen. That might be a reason why ladies often became very good micro-chemical analysts. During the war ladies had worked very successfully on micro-chemical analysis, and hairdressers, shop assistants, and so on, were trained within a very short time, whereas some men who had had university training had failed rather miserably.

It was of great advantage to have some form of training in the handling of the

apparatus. It was only in the last two years, however, that some of the principal universities had set up departments to provide courses for training in micro-analysis, due to pressure arising from the demands of industry. Once the basic training was acquired, it was possible to pass it on to others.

Representative Results

Dealing with the question whether a small sample used for micro-analysis was representative of the very much larger amount of material, Mr. Whalley said he could quote evidence either way. At one time shavings had been taken off the top and bottom of 10-ton ingots, and the results obtained, in about one-tenth of the time required for an ordinary analysis, were equally as representative. On the other hand, if the material examined were not homogeneous, there was the possibility of error. One could only answer the question by reference to the precise nature of the material with which one was dealing.

Describing and illustrating some of the apparatus and techniques used, Mr. Whalley referred first to the qualitative testing of both inorganic and organic groupings and radicals and elements. In using the micro technique, he was still a believer in the use of the ordinary analytical separation tables for a beginning; in other words, separating the elements into groups and then applying spot tests, colour tests or microscope tests. He exhibited some of the very small glassware used.

For dealing with quantities of 10 mg., tiny spoons were used instead of beakers in which to carry out reactions and precipitations. Often hooks were of value in qualitative work for scraping out tiny pieces of crystals, and filtrations were not carried out in the ordinary way; one used a centrifuge tube, centrifuged the material and separated it. His apparatus included some tiny pipettes, in which one could use if desired a small piece of filter paper of about 1/10 in. diameter.

Crystal Tests

Spot tests were of particular importance in qualitative analysis, but he preferred to use them only after the general group separation had been carried out. Crystal tests under the microscope were very easy to perform, and some of them were quite definite. Perhaps the most important of all the tests were those involving colour reaction, not only from the qualitative point of view but because many of them could be made into quantitative methods. The emission spectrograph was a very useful

tool for the qualitative examination of an unknown material.

After illustrating some micro-distillation plants, Mr. Whalley went on to deal with quantitative methods. For two years he had used just a good analytical balance for semi-micro work and had achieved extremely good results; so that such a balance could be used, given care in handling. Since then he had used a proper semi-micro balance, but he was not sure which of the two he preferred. A micro balance was necessary for working with very small amounts of material.

In using any balance for micro or semi-micro work, one must take more precautions than with an ordinary balance. One must not put on to the balance pan anything which was at all warm, and must handle the material with greater care; one's hands must not be sweaty. The balance should be in a reasonably stable position, without undue vibration, and if possible the temperature and humidity should be maintained reasonably constant, although he believed that that was not now considered to be so important as it was at one time.

A full micro balance had a sensitivity of about 1 microgram (0.000001 g.). Normally it was good enough to work to ± 10 micrograms in micro work and ± 100 grams in semi-micro work. Quartz fibre balances, by means of which one plotted deflections of a quartz fibre against the load applied, were very special and fragile, and he did not think they had a place except on the pure research side.

Colorimetry

In the analytical literature of the last 18 months, he said, a great many of the papers published had been concerned with colorimetric methods, either on the full scale or the small scale, and he was quite sure that much of the hard and back-breaking work which had been done in ordinary analytical chemistry would go by the board as the result of the use of those neat and clean methods. The chemical separations were cut down to the absolute minimum; in many cases it was not necessary to do more than one approximate separation in the first case.

Dealing with some of the applications of the micro techniques, Mr. Whalley said that in dealing with synthetic resins there was a very big place for micro-chemical analysis: the literature abounded with various schemes and methods. In that field the qualitative testing had a very great application.

Another field of application of micro techniques was that of the identification and analysis of paint flakes; he was often given scrapings from a variety of sources unknown

and was asked to find out what he could about the nature of the materials. A further use was to examine oils or fractions derived from oils, and means had had to be devised for determining acid, iodine and saponification values, etc., working with a few mg. of material. The results were comparable with those obtained by the BSI procedure; indeed, the procedure was really the BSI procedure on a smaller scale.

In the determination of acid values it was of importance to exclude all carbon dioxide from the titration vessel; one could determine it by using indicators or by electrometric end point, and the vessel must first be swept out with CO_2 -free air. The titration must be carried out without opening the vessel to the atmosphere at all.

A matter which would be of increasing importance in the investigation of the behaviour of drying oils was the direct determination of oxygen. Until recently it had not been possible to determine the uptake of oxygen other than by indirect means; but methods were becoming available, and they must needs be micro methods, for the direct determination of oxygen in organic compounds, which could equally well mean in oil.

Direct Determination of Oxygen

The method was based on the decomposition of the material in a stream of hydrogen, passing the vapours over activated charcoal, which would then convert all the oxygen to carbon monoxide; that was subjected to further treatments involving, even on the micro scale, a fairly long train.

Other applications were the determination of carbonate content and of combined water in pigments. The common method for the determination of water in paints was the Dean and Stark method, which required about 100 g. of paint and occupied a fair amount of time. Often one had not 100 g. available, but probably 10 or 15 g. only; a small apparatus had been evolved which represented a micro modification of the Dean and Stark determination.

The Dean and Stark method was being challenged in the United States by the Carl Fischer method of determination, based on the reaction between iodine, methyl alcohol and sulphur dioxide with water. He had applied it to the determination of water in oils, and it worked extremely satisfactorily for drying and non-drying oils.

He had tried to apply it to paints. It had been applied to certain non-reactive types of paints, but certain pigments caused interference by reacting with the Fischer reagent, and he had been unable to justify

the claims made by the Americans that it was universally applicable. There were distinct possibilities for the method, however, in particular fields.

In conclusion, Mr. Whalley urged that very careful thought be given to the introduction of semi-micro methods in industrial laboratories, because by their use, and with a little ingenuity, one could save an enormous amount of time and quite a lot of material in many cases.

Group Divisions

In the course of the discussion which followed Mr. Whalley's address, Mr. Neil Fisk commented that references to the short space of time required for micro estimations had rather taken one's breath away. Referring to the qualitative group analysis, it had been said that an ordinary estimation would occupy 10-15 min.; but he presumed that that referred to one or two elements, and not five or six in three or four different groups.

Mr. Whalley replied that the sub-division of the metals into the four or five principal groups could be done in 10-15 min.; he was not referring to the positive identification of the different elements in the groups.

Replying to a question by Mr. Fisk as to how long it would take to identify some five metals in three different groups, he said that that depended on the particular metals. If they were easy metals, such as copper, lead or iron, not much extra time was needed. In the case of more difficult metals, such as tin, and so on, it would take longer; others, such as strontium, etc., would take still longer, because one would have to do a further separation before one could identify them.

Semi-Micro Techniques

Dr. R. F. Bowles underlined Mr. Whalley's reference to the value of using the semi-micro techniques instead of trying to go right down to the micro scale, which was probably beyond the capacity of most laboratories. Commenting that the reduction in scale was done by reducing the volumes of the materials and not by reducing concentrations, he said that in trying to reduce the concentrations, one was likely to get into deep water. He asked whether the technique, such as the determination of acid and saponification values, could be done successfully on the micro scale, using indicators as well as electrometric titration methods, which, he had noticed, Mr. Whalley had used exclusively in the examples he had given.

The centrifuge was a laboratory instrument which was grossly neglected by the

ordinary industrial chemist, said Mr. Bowles, but he had always found it to be extremely useful and he was sure it could be used even in ordinary analysis practically to eliminate any sort of filtrations. Asking whether it was necessary to use the cumbersome syphon technique to take off the supernatant liquor, he said his experience was that, working on a semi-micro scale, it was almost always possible to decant the supernatant liquid without any loss worth bothering about; one method of enabling that to be done was to flocculate the precipitant.

Mr. Whalley replied that on the absolute micro scale the centrifuge tubes used were so narrow that, even when the precipitate was collected, if one tipped the tubes over, the liquid did not run out; the syphoning technique was the classical method of doing it. But normally one would probably use a small tube with a rubber bulb on the end, and would draw off the liquid quickly. One would not use the syphoning technique unless one were being particularly precise.

Surface Tension

Dr. Bowles suggested that one might reduce the surface tension.

Mr. Whalley replied that he was not very much in favour of the addition of extraneous materials if that could be avoided, because in particular cases those materials might interfere with a subsequent stage in the analysis. The addition of alcohol might be all right to collect the precipitate in a certain group, but when one wanted to carry on with the solution one might find the addition of the alcohol was a nuisance.

In the determination of acid values, Mr. Whalley said he had used the electrometric end point as much as possible. At first the determination of acid values was done by using the standard method modified; the results were reasonable, but it was not always easy to spot the precise titration at which the indicator changed. One could get fairly near the right answer in that way, but he did not think one could get so precisely to it as with the electrometric method.

Spot Reagents

Mr. A. E. G. Brown, referring to the examination of paint flakes, said they were usually multi layers and most people concerned wanted to know exactly what were the various elements in the layers. Using the microscope, there were spot reagents that one could apply; but one would like to know what were the chances of the extension of methods for that purpose in the future.

Mr. Whalley suggested that one instrument which could be used for that and which had been used in connection with similar problems was the emission spectrograph; but, of course, it was not available to everybody. There was a great field of qualitative analysis using that instrument.

Mr. R. Kinsman, referring to the use of rubber tubing for connecting the various parts of the apparatus Mr. Whalley had illustrated, asked if that were satisfactory as compared with ground glass for connections.

Mr. Whalley replied that the micro analyst was proud of his rubber tubing and did not like ground glass joints for the collection of materials to be weighed very accurately. The rubber tubing used at the beginning of the apparatus was a specially treated pure rubber tubing. The tubing used at the end of the apparatus, where the gases were collected, was impregnated with paraffin wax under vacuum, to fill up the pores. Usually the whole system was under slight pressure.

Mr. H. Pass, who proposed the thanks of the meeting to Mr. Whalley, said that obviously the literature on the subject of micro-analysis was scattered. Most of it was intended for people who had acquired the technique. He wondered whether there was a standard text book available.

Mr. Whalley replied that there was no general text book covering every field. There were text books dealing with qualitative inorganic analysis, others with quantitative organic and quantitative inorganic analysis, others with micro colorimetric methods, and so on; but there was none which collected all the techniques together.

Welsh Lead Revival

Miners are working a three-shift system re-opening what is believed to be one of the richest lead mines in North Wales, about three miles from Conway. Abandoned 30 years ago, because the price of lead was not remunerative enough, the mine has regained its importance because of the high value of lead. The surface entrance to the 600 ft. shaft was uncovered last summer and since then considerable progress has been made. Head-gear has been erected over the shaft which has been driven more than 130 ft. and faced with concrete. As soon as the workings have been cleared of water the mine will be re-assayed. Mr. Sidney Kitchen, mining engineer and general manager of Treacastell Mines, Ltd., believes the mine to be rich in lead and zinc. Future operations will depend on the nature of the report.

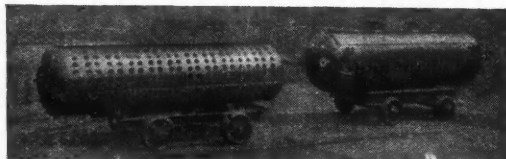
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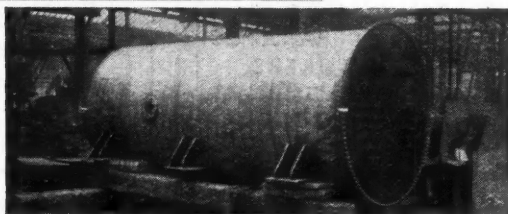


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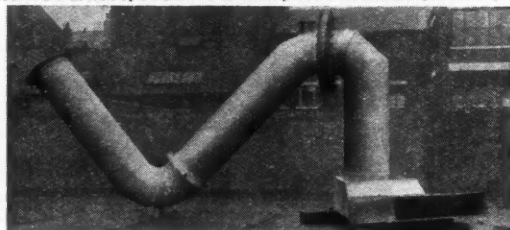
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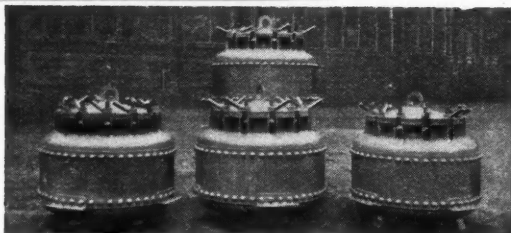


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TEMPERATURE-PRESSURE RESISTANCE

Special Steels for Chemical Plant

From a Special Correspondent

RESearch on steels for chemical plant construction continues to be developed with a vigour that is represented by the increasing number of preparations which are placed on the market. The great increase in operating pressures and temperatures has involved markedly more severe demands in respect of the heat endurance of such metals.

Until comparatively recently, a number of selected metals and common alloy steels, notably nickel steels, were subject to serious losses of strength as temperatures rose, which in turn necessitated a correspondingly greater wall thickness. A heavy drop in the yield point was undesirable at the high temperatures and pressures involved if the shape of the vessels was to be fully retained.

The urgent need was to provide, without appreciably increasing the price, materials which would retain the favourable machining and welding properties of steels formerly used, and afford under more severe operating conditions high resistance to mechanical stress at high temperatures.

Vanadium and Molybdenum Steels

Research was first undertaken with low-carbon, non-silicon steels, the initial development of which took place some years prior to the war, with the introduction of low-carbon, silicon-free vanadium steels, containing 0.2 per cent vanadium and 0.18 per cent carbon. (Detailed particulars of these appeared in *Archiv für das Eisenhüttenwesen* No. 12, and combination stressing deformation-time diagrams in No. 20 of the same publication.)

The great difficulty of obtaining suitable quantities of vanadium offset to some extent the advantages which were offered by many vanadium steels. Research on the alloy mentioned, inspired by these shortages, ultimately revealed that by substituting a 0.3 per cent molybdenum steel of the same physical properties at both ordinary and high temperatures, it was possible to reduce the carbon content to some 0.12 per cent. It was thus possible to obtain a more favour-

able behaviour in welding with water-gas, in the open-fire, or by other methods.

In high-pressure vessel construction, this molybdenum alloyed steel offered the additional advantages over the vanadium steel of much lower production costs. Compared with an unalloyed carbon steel of corresponding welding qualities, the yield stress values of this metal were very favourable—at temperatures of around 500° C. the superiority is approximately 100 per cent.

Test Results

For these tests, the loading speed ranged at the rate of 70 p.s.i. per second, and the temperatures from 20° to 500° C. Besides comparing plain carbon, vanadium, and molybdenum steel plates, yield stresses were recorded of the welded seams of each of them, so that a reliable criterion of the values could be obtained. The yield stress at 300° C. and over was markedly influenced by the rate of loading and the duration of load.

This followed earlier researches (V.D.I., 29, 1497) where the values obtained proved higher the more rapidly the load was increased, and these led to elaborate long-range tests. Carried out over long periods at constant load and temperature, with a wide variety of metals, these studies soon demonstrated that vanadium and molybdenum steel plates were materially superior to others for many forms of high-pressure and high-temperature chemical plant.

Nature of Investigations

It was because of these investigations that molybdenum steels were developed for vats, tanks, and other high-stress accessories and gave impetus to the production of tubes, and castings, besides sheets and plates.

At temperatures above 350°C. they were found to be superior to nickel steel in the matter of creep properties, and also permitted easy welding.

Corrugated fire-box tubes are known to develop bulges and other deformations, due to localised deposits, with resultant distur-

ance of heat transfer. It was found more profitable to substitute molybdenum steel for other metals to obviate interruptions of service, and the costly remedying of defects at short notice. Quite a number of cast molybdenum steel valves are now in service for pressures of 1400 lb. p.s.i., and 475°C. steam superheat.

While the creep of steels practically ceases after a specified time, so long as the stresses are low, the creep limit is represented by the limit stress beyond which an increase causes the material to continue to extend until fracture occurs. This now appears to be fully understood, as it was not when the first detailed account was published on the Continent. (*V.D.I.*, 29, 1634).

The testing equipment used in creep tests at high temperatures has since been greatly improved; at the temperatures prevailing in service conditions it is now possible to confirm the properties and behaviour by increasing the sustained load by successive steps. The designer is thus able to take full advantage of the material for the particular chemical purpose in hand, employing the data laid down in a combined stress-deformation-time diagram.

In one example, a vanadium steel under a sustained load of 14,200 lb. p.s.i. at 500°C.

showed no creep ascertainable with ordinary measuring instruments, after 1000 hours, whereas plain steel of 0.1 per cent carbon failed after 112 hours. Molybdenum steel of the type referred to, likewise showed no measurable change under the same circumstances.

The record of other plain steels indicated that, employing 0.14 per cent carbon, failure took place after 264 hours; with 0.19 per cent carbon steel after 584 hours; and 0.31 carbon steel after 650 hours. The last alloy, moreover, was rendered unsuitable for effective welding.

Details of the behaviour of low-carbon molybdenum steel under successively increased long-duration load and other ageing features appeared in the initial issue of *Archiv für Warmewirtschaft und Dampf-kesselwesen* and the subject was later elaborated in issues of *Stahl und Eisen*.

The various papers mentioned contain numerous tables, curves, and graphical representations to prove the claims of how sheets and plates can be rendered suitable for high-pressure, and high-temperature process plant. This, however, does not take account of the problem of corrosion, which many of the chemical reagents used render of paramount interest.

Aluminium from High-Silica Bauxites

THE undiminished European demand for aluminium and its alloys continues to run at so high a level that it becomes more that ever necessary to utilise all possible mineral sources, including clays and low grade bauxites such as those of high silica content. In *Chim. et Ind.*, 1948, 60, 336-8, Prof. P. Remy-Genneté, of Clermont, reviews some of the recent history of the numerous attempts in this direction, including a reference to the series of articles in *THE CHEMICAL AGE*, 1947, 56, 149, 219, 339, 607 and 717, by Prytherch *et al.* and a summary of work by A. Ramuz (*Ann. Chim.*, 1948, 3, 271-315) and of French patent No. 909,536, of January 2, 1946, in the name of I. de Vecchis and O. Ramuz.

The last deals with siliceous and ferrous bauxites. These are treated at 1000°C. with lime or calcium carbonate, yielding calcium aluminate, and then, by double decomposition, sodium aluminate. The product is filtered and alumina formed in the usual way, together with sodium carbonate. The iron is in the form of Fe_2O_3 (oxidation to Fe_2O_3 is prevented) which, magnetised, is removed by magnetic separation for the manufacture of cast iron.

In the paper by A. Ramuz (*loc. cit.*) the bauxite obtained from Villavayrac consisted

of 48.24 per cent Al_2O_3 , 32.27 per cent Fe_2O_3 , 6.9 per cent SiO_2 , 2.26 per cent TiO_2 , with loss on heating of 10.35 per cent. This was treated with various alkaline earths and magnesium oxides. The one chiefly used contained 55.75 CaO, with 0.1 per cent MgO and lost on heating 44.19 per cent. The mixture was heated either dry, as paste, or granulated, with yields of alumina respectively of 46, 39, and 79 per cent. Thus, in the granulated form was given by far the highest yield. Calcium carbonate or chalk, preferably calcinated, would also be suitable. A Meker crucible furnace was used with refractory clay crucible, but Remy-Genneté thinks it would be better to use a rotary kiln.

It is concluded that: (a) natural alumina is more reactive than artificial; (b) at 900°C. with 100 g. of reacting material (bauxite plus calcium carbonate) the yield is 74.5 per cent calcined alumina; this, according to Ramuz, is a minimum and would be higher under the more favourable conditions possible with large scale working. Even laboratory tests with more material, e.g., 300 g., gave higher yields, up to 79 per cent. The alumina obtained was very pure, with less than 0.1 per cent silica.

Radioactivity Studies of Metal

NOTING that atoms do a lot of travelling between the grains of a metal sample, scientists at the (U.S.) General Electric Research Laboratory, Schenectady, New York, are making effective use of radioactive material to trace atomic movement. In an experiment just completed, it has been found that silver atoms in metallic silver may move between the grains $1/16$ in. per week at 500°C . It is believed, however, that atoms passing through rather than round the grains take about 10,000 years to move an inch.

Silver-110 Used

The experiment was done with a radioactive isotope of silver, called "silver-110," which was electroplated on the surface of an ordinary silver block. After several hours at 500°C , the specimen was cooled and layers the thickness of tissue paper were shaved from the block. Each layer was checked for radioactivity with a Geiger counter, to determine how far the tagged atoms had penetrated.

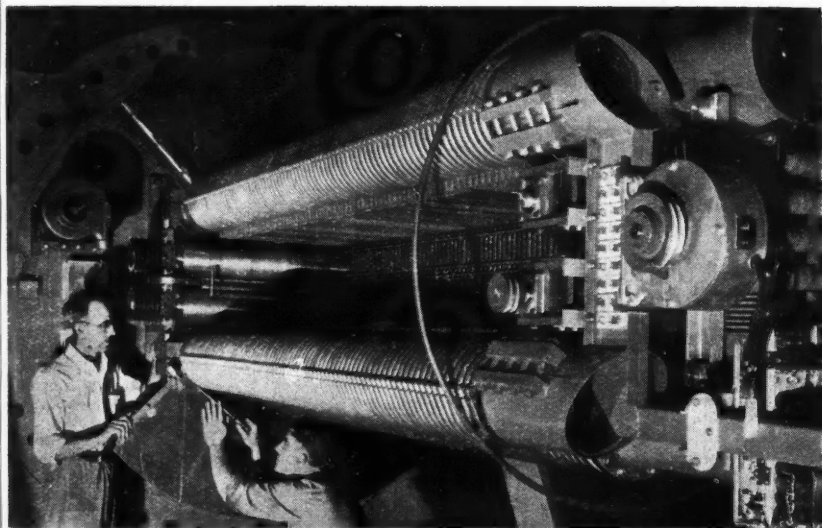
The studies, which are continuing at the G.E. laboratory, are capable of throwing new light on the internal structure of metals. By knowing how such atoms will behave under various conditions, the scientists hope

to be able to "design" metals for specific requirements.

The radioactive silver-110 is said to be a potent source of detectable beta- and gamma-rays. The material is "diluted" to an emissive level which is not harmful if touched.

Enlarging activity in another sphere of its operations, the company's general engineering and consulting laboratory is now in the process of building a 3.5 million-volt electrostatic accelerator for the Brookhaven National Laboratory at Upton, Long Island, New York. One of several electro-nuclear machines planned for the newest of the atomic research centres in the U.S.A., the accelerator will be used for a variety of fundamental studies of the atomic nucleus. In some experiments, high-energy particles from the accelerator will be employed to study the processes of "chipping" or "splitting" atomic nuclei into fragments such as the radioactive isotopes now widely applied in research.

Although the electrostatic accelerator has an output energy considerably lower than such machines as the synchrotron, betatron, and cyclotron, it has the advantage of supplying high-speed atomic particles at a uniform velocity.



This new G.E.C. electrostatic accelerator, designed to direct a stream of protons at a target, is expected to make possible important advances in some research techniques at the U.S. Brookhaven National Research Laboratory

Northern Rhodesia's Copper

by H. MACLEAR BATE

IN this age of advanced scientific development, when the world is divided into several economic and political factions diametrically opposed to each other, it is comparatively easy to understand the existence of divergencies in the policies followed

Central Africa whose geographical position is at once a great political and economic burden. In area it is perhaps three times the size of Great Britain; its climate is temperate and it supports an African population of about 1.6 million and 30,000 Europeans.

From that viewpoint Northern Rhodesia is of little consequence, but the country's immense copper deposits at once make it both an immediate and potential area of paramount economic and strategic importance.

It is unnecessary to stress the truly vital functions of copper in industry, but it is pertinent to relate the importance of copper to industry with Northern Rhodesia's importance to Empire strategy.

Northern Rhodesia ranks high among the world's producers of copper—probably third—and is the greatest producer within the sterling group. In 1947 over 200,000 tons of copper were exported to sterling countries, and were valued at £23 million. This represents at least 40 per cent of this country's annual consumption. Ten years ago copper accounted for 99 per cent of Northern Rhodesia's exports, which at once suggests an extremely unbalanced economy.

The same circumstance exists in The Gambia, where groundnuts represent the only export of consequence.

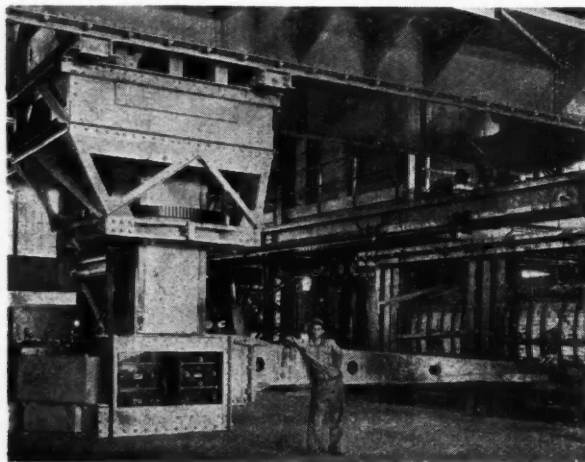
It is true, of course, that in recent years zinc, lead, and cobalt have become increas-

***I**n this article the writer, who has spent many years in various parts of Africa south of the Sahara, sets out to show the political and economic consequences of the geological distribution of copper ore in relation to the strategic interests of the British Commonwealth. As a corollary to what he has to say, there arises also the important question—again from both a strategic and an economic point of view—of building up stocks of raw copper in various countries*

by our economists and politicians. But, in the final analysis, national politics remain, or should remain, an extension of national economics.

Here one can only deal with a minute aspect of the part that non-ferrous metals play in the overall strategic picture from an Imperial point of view.

To take one British protectorate, Northern Rhodesia, and glance at the part it plays, and is destined to play, in Empire affairs: here is a land-locked territory in



Left: The cathode charging crane at one of the production centres in Northern Rhodesia of the Rhokana Corporation. Facing page: Part of the most productive source of the metal, one of the corporation's electrolytic tank houses

ingly important in Northern Rhodesia's exports—£21,000, £938,000 and £400,000 respectively. It is equally true that in the Lusaka area there are enormous deposits of high grade hematite.

Not so long ago Thomas Firth and John Brown, Ltd., withdrew its support from a scheme to produce pig-iron in Northern Rhodesia. It was envisaged that 500,000 tons would be the annual production. John Brown & Co. is still interested in the country and has a subsidiary company in Southern Rhodesia.

The surveys carried out at the time estimated 800 million tons of high grade iron ore but containing too high a silica content for satisfactory reduction. The deposits of high grade hematite were estimated at 40 million tons. Since then, however, modified reports have appeared assessing a silica content of only 2 per cent to a maximum of 7 per cent. Moreover, the iron ore deposits had apparently been assessed most conservatively. As a result, an intensive drilling programme has been inaugurated by The Rhodesian Corporation, Ltd.

Alternative Supplies

It is, however, from copper that Northern Rhodesia derives its importance from the material aspect. Alternative sources of supply are the U.S.A., Canada and other countries belonging to the hard currency groups. The £23 million a year spent on Northern Rhodesian copper therefore represents a proportionate number of dollars saved.

Arising out of this, it is interesting to note comparisons in cost of production. Northern Rhodesia's four major mines are equipped for low cost production, possessing large ore bodies which contain three times the average metal content of American copper mines.

Ore Average

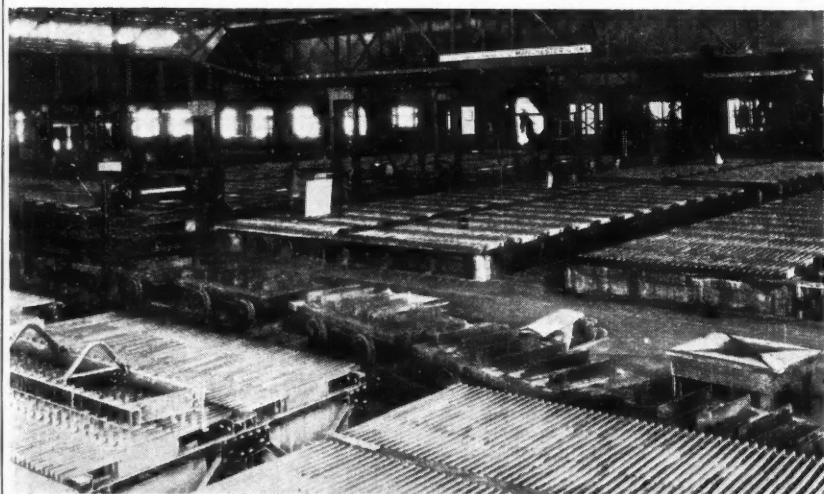
Roan Antelope, one of the largest mines, produced 55,600 tons of copper in 1944-6. The ore average was 3.2 per cent copper, against only 1 per cent of the principal copper mine in Nevada. In 1934, Roan's copper cost was £19 10s. a long ton of blister, which placed the mine as one of the lowest cost producers in the world.

By 1947, the cost of production reached £52 per ton and, allowing for other overhead charges, nearly £60 per ton. The cause of this almost meteoric rise was certainly not inefficiency or deterioration in skill.

During the same time there has been a remarkable increase in the price of copper, but in spite of most attractive prices and high dividends, there has been practically no increase in production.

Mufulira Copper Mines, Ltd., paid a dividend of 37½ per cent in 1947-48 as against 25 per cent the previous year. Rhokana Corporation in 1947-48 disappointed its shareholders by paying only 75 per cent—100 per cent was expected. The same mines paid a dividend of 80 per cent in 1945-46.

There is no question that more copper



could be produced but there are certain very definite limiting factors. Primarily there is a serious shortage of rolling stock. Coal has to be brought a considerable distance by rail, and the copper is exported *via* Beira in Portuguese East Africa under a long-term agreement. The haul to the port of Beira is 1250 miles. This shortage of rolling stock is obviously only a temporary disability but it is a bottleneck for all that.

Port Congestion

Another equally serious limiting factor is congestion at the port of Beira itself and few experts would suggest that difficulties there are of only a temporary nature. An alternative is to rail the copper to Cape Town, a distance of another 700 miles at the most. Here, however, serious difficulties would arise because of the existing agreement to ship through the port of Beira.

A glance at the map suggests that a railway should be built to connect the copper belt with Lobito Bay, but here again an argument is "why should British capital be expended on developing a harbour and a railway system through foreign territories?" Only a few weeks ago British shareholders had the mortification of seeing one of the rapidly dwindling foreign assets sold. This was the very railway which connects the Rhodesias with the East Coast.

The railway was built with British capital; so was the port of Beira. Both owe their existence and justification to British enterprise, yet they have now reverted to our oldest ally, Portugal. The general public had no interest in this and the only indications that these negotiations were on foot were short references in the British Press to the visit of Sir Godfrey Huggins, Prime Minister of Southern Rhodesia, to Lisbon in November last.

Railway Transport

The upshot of all this has been to revive interest in the construction of another railway to link up with the present and projected railway system in Tanganyika and Kenya. There is no doubt that such a plan is feasible and, in its way, less ambitious than the grandiose groundnut scheme in Tanganyika.

Some reports have been published giving a figure of £17 million as the cost of constructing such a railway. But this figure is considered much too low by those who will not permit enthusiasm to colour their judgment. In any case, it may be another two years before any active steps are taken to implement the plan.

In the meantime, a very much more dynamic move is on foot, and that is to bring about a federation of the three British Central African territories, Southern and Northern Rhodesia and Nyasaland. As a plan it is fraught with difficulties of a complex nature.

Southern Rhodesia has the unique status of being a self-governing colony, whereas the other two territories are protectorates. The native policy of Southern Rhodesia differs fundamentally from that of the protectorates. This, by a logical sequence of arguments, rules out a Dominion of Central Africa, but in a federation each territory can retain a certain degree of autonomy.

There is opposition to the idea of federation in Whitehall, and one of the most learned authorities on colonial affairs told the writer a few weeks ago that federation would not be permitted.

Mineral Rights

The driving motive behind the desire for federation is a patriotic one. As far as Northern Rhodesia is concerned, the feeling is that it is not right that every ton of copper produced—a diminishing asset—should yield an immense revenue to a non-resident company. The mineral rights are owned by the British South Africa Company, to whom a royalty is paid on a sliding scale. There is no suggestion that these royalty rights should be expropriated arbitrarily, but that they should be renounced for a cash payment. This could be determined if Northern Rhodesia had sovereign rights.

On the other hand, it is appreciated that without the imagination and courage of the founders of the British South Africa Company there could have been no Northern Rhodesia.

Whatever happens, there can be no doubt that Rhodesia's copper output must be geared to Empire economy, and the highest ambition of the British Central African territories is to play the maximum part possible to them. They do not regard political developments in South Africa with the same alarm as some people outside the African continent, but they do feel their destiny lies largely in their own hands and they resent the palsy inherent in remote control from a headquarters thousands of miles away.

Belgium's Steel Output.—Belgium produced last year 3.9 million metric tons of steel—just over a million tons short of the figure scheduled under the Marshall Plan. Export prospects are still considered favourable.

ELECTROLYTIC METAL POLISHING—V

Techniques for Steel, Brass and Silver

From a Special Correspondent

IN the paper of the Dutch delegates, H. C. J. de Decker *et al.*, at the third International Electrodeposition Conference, already referred to, the methods of De Sy and Haemers were described in some detail, and included the electro-polishing of ordinary carbon steels.

These methods are distinguished by a high current density as compared with those of Jacquet and some others, namely, of the order of 4.5 amp./cm², and the time required is reduced to about 10 seconds. Polishing is accompanied also by an etching effect. The Dutch authors, as a result of their own work, have devised suitable techniques for the application of both Jacquet's and De Sy's processes to a large number of non-ferrous alloys.

The technique for steels containing 0.02, 0.6, or 1.2 per cent carbon and normalised was as follows: Pre-treatment consists in grinding up to emery paper grade 0; electrolyte comprises one vol. of 20 per cent perchloric acid, plus four vols. of 96 per cent ethyl alcohol. Etch-polishing is done with surface horizontal, just submerged, 7.8 cm. over 18:8 stainless steel cathode, using a cooling spiral and stirring before and after etch-polishing. The principal requirements are approximately 110 v., c.d. of 4 amp./cm², maximum temperature 35°C., time 10 sec.

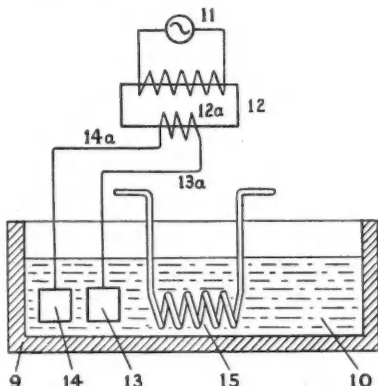
After-treatment included rinsing with water and drying and the specimen showed a relief observable only with oblique illumination, as illustrated in the original. The actual structural picture is obtained after etching with one of the usual solutions.

Test Results

With the 0.6 and 1.2 C steels, only the edges were polished smooth and bright, so that the c.d. used, which could not then be exceeded, was apparently still insufficient. Fuller details are given in the original by de Sy and Haemers. Further research is still being undertaken at the Dutch Central Institution for Testing Materials (CIMO) at Delft.

It is interesting to note that here, as elsewhere, results obtained have been found to be very sensitive to variations in the factors involved, as shown by various examples, of which one relating to stainless steel may be briefly recorded.

When stainless steel (18:8) was used a satisfactory polishing effect could be obtained with baths containing phosphoric acid, sulphuric acid, glycerine and water.



9 container; 10 electrolyte; 11 dynamo; 12 & 12a transformer; 13 & 14 electrodes; 13a & 14a electrode leads; 15 cooling coil

The polishing of a finely ground surface must be continued for a rather long time.

Much fuller information on the electro-polishing of iron and steel is being afforded in Jacquet's second volume, and fuller discussion of basic principles.

It is well known that electro-polishing of steel has been extensively developed in the U.S.A., as evidenced by American patent and technical literature. The patents, as so frequently happens, record only relatively slight advances, but some of them are of interest in directing attention to factors which, if not overlooked, tend perhaps to be under-rated.

In a recent English patent application (4599/1948, open to public inspection) of The Alloy Research Corporation considerable improvement in the electro-polishing of stainless steel is claimed as a result of using a.c. (instead of the usual d.c.) and a relatively low c.d. in a simple and robust apparatus. (Figure above.)

The bath used consists of a concentration of nitric acid, with or without a substantial amount of concentrated acetic acid. Current supply is through the transformer shown, opposite ends of which are connected respectively with suitably spaced immersed electrodes, of which one (13) is lead or may be the lining of the container and the other

is the stainless steel anode to be polished. C.d. is 0.5-4 amp./sq. in., but may be increased to 12 or more. Temperature should be kept below 25°C. by cooling coil and/or stirring. Time required is 3 minutes.

The polishing of brass pressings was the subject of a paper by P. Berger, at the London Conference, and was of considerable interest from both a theoretical and practical point of view.

Choice of Electrolyte

Reverting to the anodic film, this may be either mainly gaseous, or viscous electrolyte saturated with dissolution products. Both are always present and there is usually a polarisation effect. The character of the film determines the quality of the result and, if it is for the most part liquid, effective control is possible. The nature of the film, in turn, depends on the electrolyte and the anode to be polished and possibly other factors.

It was decided that a compromise had to be reached on the relative merits of each type of electrolyte, so that the one chosen should be a good anode solvent and have high conductivity with good current distribution, and above all ensure the right kind of film with a proper and controllable ratio of gas : liquid.

Such desiderata were found in a mixture of phosphoric and chromic acids with addition agents. Among the latter, sulphamic acid was very effective, but the requisite amount could not be obtained at an economic price; and so a mixture of sulphuric and hydrofluoric acids with some fatty acid (propionic) was eventually used as addition agent.

Operating conditions, general industrial applications including brasses containing lead—for which a different electrolyte was required—practical points and equipment, operating cycle, control, maintenance, and costs, are given in some detail. Emphasis is laid on the need for repeated rinsing.

Both Jacquet's survey and in that of R. E. Halut on technical applications mentioned this subject. Parenthetically, it may be noted also that the latter author dealt with the use of perchloric acid electrolytes and their supposed risk.

These electrolytes have much interest in special cases; for example, they alone have the quality, according to Halut, of producing optical mirrors. Thus it is to be hoped there will be serious research to define conditions of their use in safety. Such a study is actually in progress in France under the direction of P. Jacquet. They should prove of value in the electro-polishing of silver.

In a recent patent of A. D. Little, Inc.

(E.P. 32311/1947; open to public inspection) is claimed an improved method of electro-polishing, with particular reference to silver. The essential features appear to be, first, the use of potassium cyanide as electrolyte; second, a positively varied potential through definite time intervals. This patent application is presumably the equivalent of U.S. patent No. 2,416,294, given in Halut's reference list, and dated February 25, 1947.

While a controlled constant potential is useful and desirable, it sometimes presents serious problems. It has now been found by the patentees that if the potential is positively varied between pre-determined limits of voltage and c.d., and in pre-determined time intervals, results are improved. The factor to be controlled here is time, which is much less troublesome than accurate voltage control.

In the present invention, it is found that by imposing a positively controlled and pre-determined fluctuation of potential through at least part of the range between polarisation and permanent discoloration—but without maintaining potential above or below this range for the greater part of period of each fluctuation—a polishing effect is developed progressively. By continuing such controlled fluctuating for sufficient time, and then switching off or removing the anode from the electrolyte, the anode is polished to the desired degree.

Variable Factors

The exact mechanism of polishing is not understood but appears to relate to unequal dissolution of silver from protuberances as compared with depressions, and to the continued formation of insoluble cyanides in the depressions with soluble cyanides on the peaks.

Whatever the explanation, the practical result is not in doubt. Voltage may be varied in a number of ways within certain limits. Perhaps the principal advantage of the present method is that it removes the need for constant voltage.

(Concluded)

"LION BRAND" METALS AND ALLOYS

MINERALS AND ORES
RUTILE, ILMENITE, ZIRCON,
MONAZITE, MANGANESE, Etc

**BLACKWELL'S
METALLURGICAL WORKS LTD.**

GARSTON, LIVERPOOL, 19

ESTABLISHED 1869

Technical Publications

A NEW series of technical bulletins being issued by A. Roake Roberts & Co., Ltd., gives data of characteristics, the use and chemical composition of some of the commercial chemicals supplied by them. Bulletins just issued deal with the following: Novenates, a series of metallic derivatives for waterproofing, rot-proofing, and the preservation of ropes, fishing nets, sails, and awnings; calcium stearate as a lubricant in metal drawing, extruding and stamping processes; di-butyl tartrate as a plasticiser; tri-ethyl citrate for paint removal, as a softener for starch ethers and a plasticiser; methyl stearate as an additive for lubricating oils; tri-butyl citrate used as plasticiser and an efficient anti-foaming agent.

* * *

Conservation of eyesight is, admittedly, one of the continuing problems confronting industrial safety authorities. It has been found that protection of the eyes from excessive exposure to radiant energy is as important as protection from mechanical injury. Information on the transmissive properties of most of the widely distributed makes of tinted lenses is now available in a new circular, "Spectral-Transmissive Properties and Use of Eye-Protective Glasses," recently issued by the U.S. National Bureau of Standards. This publication (Circular C471) is the result of a study of about 200 glasses intended for use either as sun glasses or in special industrial operations where injurious amounts of radiant energy are present. It can be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C., U.S.A. (20 cents a copy).

* * *

British scientific glassware is rapidly gaining an unassailable position among world competitors. One of the firms which has helped to attain this, is H. J. Elliott, Ltd., with a policy of high quality production at its organisation on the Treforest Trading Estate, Glamorgan. A handsomely produced and illustrated catalogue covering the company's "E-mil" brand graduated volumetric glassware and chemical thermometers has just been issued, published in loose leaf form so that additional pages may be added. It reproduces extremely well the high quality standard which is being attained in specialised glassware by the new individual methods, which have been described here (THE CHEMICAL AGE, 59, 786).



The "Tektor" Proximity Detector

An important addition to the widening range of appliances designed for increased application of automatic control, is a new proximity detector which records the approach of any substance to a predetermined level. The "Tektor," manufactured by Fielden (Electronics), Ltd., is evidently capable of serving a great number of uses and is likely to be especially applicable to many processes in chemical industries.

* * *

A new technical data book being offered by the Phosphor Bronze Corporation, 2200 Washington Avenue, Philadelphia 46, Pa., affords tabular data of the physical properties, chemical analyses, specifications and typical uses of the many forms of phosphor-bronze alloy, together with special spring design and machinability data.

* * *

The first export journal to be produced by the Mullard organisation has just been issued. Entitled "Mullard World Review," its object is to form a link between headquarters in England and all representatives abroad. The journal contains 16 pages, a variety of articles, and is attractively laid out with numerous illustrations.

American Chemical Notebook

From Our New York Correspondent

CONSTRUCTION of a new \$200,000 recovery unit has been begun by the Tennessee Valley Authority at its Godwin phosphate sintering plant, and is expected to be in operation by June this year. This is the second such undertaking in the last few months, plans for the erection of a scrubbing unit at its Columbia, Tennessee, phosphorus plant having been recently announced by the Monsanto Chemical Company. The new TVA recovery system consists of a limestone-packed tower through which the gases are drawn so that the fluorine is recovered in the marketable form of calcium fluoride or synthetic fluor-spar. The process, which is inexpensive to install and simple to operate, is available to private industry.

* * *

In spite of an increase in production of aluminium in America, and the continued decrease of orders since June last year, the acute shortage of this metal is reflected by producers still being unable to meet demands in full. Output in October, 1948, according to the U.S. Bureau of Mines, was 54,526 short tons, an increase of 2 per cent over the previous month. There was an all-round increase in prices, and imports of aluminium were also higher in October than September, being, in fact, the largest for 1948. Over 96 per cent came from Canada, and the remainder from Norway, Switzerland, and the United Kingdom.

* * *

New production records of bauxite were established in the third quarter of 1948 with a total of 446,146 long tons (dried equivalent), this being the highest figure for any three-month period since the fourth quarter of 1944. Over 96 per cent of the domestic production in this record came from mines in Arkansas. Imports for this quarter also showed an increase of two per cent. Surinam continued to be the leading exporter of bauxite to the U.S.A. with 493,778 long tons during the period July-September; the Netherlands Indies showed the largest gain, while shipments from British Guiana declined for the third successive quarter.

* * *

E. I. Du Pont de Nemours & Co., Inc., on December 31, 1948, was owned by 94,901 stockholders, an increase of 344 over the number recorded at the third quarter of that year. This figure is greater by 3700 than the number of holders on December 31, 1947. (More than half the stockholders are women.)

Return to a free market and competition in the synthetic rubber field is expected shortly, with the termination of the U.S. Government-sponsored patent pooling agreement which came into effect soon after Pearl Harbour in 1941. Mr. John L. Collyer, president of the B. F. Goodrich Company, announced that the major companies concerned had agreed terms for the return to free competition. Steps to rehabilitate the Dolok Merangir rubber estate plantation on Sumatra, were disclosed by P. W. Litchfield, chairman of the Goodyear Tyre and Rubber Company. The company has retaken possession of the 20,000-acre plantation which was captured by the Japanese early in 1942.

* * *

An export quota of 113,000 net tons of tinplate for the second quarter of 1949 has been announced by the U.S. Department of Commerce. Approved foreign orders up to the limit will be supported by ratings (exs) and must be accepted by the tin mills. This tonnage is the minimum considered necessary to carry out foreign objectives.

* * *

Despite anticipations of a decline, U.S. production of zinc totalled 950,355 tons in 1948, a gain of 2328 tons over the previous year, according to the American Zinc Institute. The industry has ample supplies of ores and concentrates and full utilisation of smelter capacity is expected to hasten the balance of supply and demand during the current year.

* * *

Making cyclotrons is becoming almost an established industry in the U.S.A. The American Iron and Steel Institute reports that over a period of eight months, 30 steel companies have supplied 160,000 tons of special magnets for scientists in the U.S.A. and abroad. It is known that 36 cyclotrons are in operation or being constructed in the U.S.A., England, Italy, France, Germany, Norway, and Sweden. The U.S.S.R. is believed to have about three.

Government Loans for Canadian Steel.

Indicating Canada's determination to secure a big improvement in home production of steel is the Canadian Government proposal to provide on loan to steel companies as much money as they themselves are prepared to allocate for capital expansion. Authority to provide the funds was being sought in the Canadian Parliament last week.

LETTERS TO THE EDITOR

Inadequate Representation of Chemists

SIR,—The *Sausage* Board's members are of the opinion that the interests of chemists in the employment of the British *Sausage* Authority are adequately represented on the National Joint Board through the *Sausage* Machine Engineers' Association."

I venture to suggest that if chemists in the food industry, or indeed in any other industry, saw a notice such as I have produced above they would begin to wonder what was happening to the chemical profession. I have just read a letter which contained the above statement except for the four words in italics which are substituted for the original words.

The authority referred to in the original letter is one set up by H.M. Government to run a nationalised industry, and while I do not wish to criticise them or the association in any way I do believe that it is quite wrong for members of a highly specialised profession such as the chemical profession to be represented on the national board by an association of engineers. Indeed, I will go so far as to say that I doubt if it is in the interests of the engineers either.

The nationalisation of various industries is creating many situations of this kind and industrial firms are following the example of the Government.

I could quote cases where chemists have joined unions which have no connection at all with any profession. In one firm in the North a union representing a variety of clerical and warehouse workers secured 15 members out of a chemical staff of 100 juniors and was then officially recognised as the body to negotiate on behalf of the 100. Many if not all of those hundred juniors are training to become fully qualified chemists capable of holding senior posts in various departments; they need the advice and assistance of a professional union at every stage and they are ill-advised when they allow any non-professional body to be recognised as qualified to act for them.

It is time that the greatest possible publicity was given to this matter in the hope that chemists will decide that it is time they united in their own interests.

I have the honour to be president of the only association registered as a trade union for the purpose of representing chemists as a united body. Unfortunately chemists do not seem to believe that it is possible that a trade union can include in its membership all the members of a profession whether they be students, junior assistants, seniors,

managers or even directors of firms. They do not seem to appreciate that a professional union can unite the members in such a manner that each can receive assistance in time of need, and I can assure you, Sir, that directors of firms seem to need the help of such a union almost as often as juniors.

During my period of office as president of the British Association of Chemists I have had ample opportunity of learning that such an association working side by side with the appropriate professional bodies is very necessary if the unity of any profession is to be secured in the face of the disruptive elements at work to-day, and I am actively pursuing a programme which I hope will lead to a complete change in the outlook of the chemical profession towards professional unions.

May I appeal through your columns to all members of the profession to consider seriously where their duty to their profession and themselves may lie. The British Association of Chemists offers membership as student, associate or full members to every person qualified as a chemist or seriously striving to become so qualified, and we can give assistance in economic, legal and other matters of a kind which can only be given by a body registered as a trade union.

We do not pretend to be a qualifying body—we leave that to the Royal Institute of Chemistry—but we look forward to the day when the association and the institute work side by side in the interests of all chemists.—Yours faithfully,

NORMAN SHELDON

30 Curzon Street.
London, W.1.

* * *

Athole G. Allen's Decision

SIR,—We trust you will allow us to make a correction of the misleading statement in your issue of January 8, 1949, under "News Summary of 1948—February," that the reason given by us for the suspension of production of certain of our products was due to shortage of raw materials.

We think it was made clear by our circular "Suspension of Production," dated February 2, 1948, and by the subsequent publicity we were able to get, that the more important reasons were inability to maintain our customary good efficiencies under existing conditions, and the fear of victimisation because of our non-membership of so-called voluntary trade organisations, now openly

(Continued at foot of next page)

Carbonisation Policy

Scientists Under-rated

AT the first annual meeting at Durham of the Mutual Association (an organisation of coal carbonisation officials and technologists in County Durham), Mr. J. D. Murray, Labour M.P. for Spennymoor, referred to development plans in the county proposed by the National Coal Board. He stated that reconstruction plans were in progress at 19 collieries in the county and similar plans were being considered for a further 15 pits.

Rising Plant Costs

Referring to carbonisation, he noted that the cost of plant of this kind had increased three-fold since 1939. He claimed that, before nationalisation the organisation of carbonisation was "hopelessly confused." With the nationalisation of steel, there would be for the first time a framework within which there could be effective co-ordination for the development of carbonisation. He considered that this country should export nothing but steam coal. Buyers abroad should not have all the benefit of the by-products.

Mr. E. F. Thompson (secretary of the association) claimed that the scientist was under-rated by the Coal Board, and that some coke works were uneconomic. He forecast that there would never be a strike among coke men and scientists. They had a great interest in their job, but they thought that they should be paid more, in accordance with the basic standard.

LETTERS TO THE EDITOR

(Continued from previous page)

accepted by Government departments as the sole channel of communication with industry.

It was not the shortage of materials, but fears for our continued existence as a free individual concern, which decided our suspension of production.—Yours, etc.

ATHOLE G. ALLEN,

Governing Director,

Athole G. Allen (Stockton), Ltd.

[Our news summary had in mind the following reason, quoted by the company as one of the several factors affecting its decision to suspend production of barium chloride, ferric chloride, ferrous chloride, toluene nitration products and soda crystals: "The supply of witherite, from the National Coal Board, one of our principal raw materials, has suddenly become very uncertain, and even today (February, 1948) we do not know the quantity available to us for the 1948 delivery period. Meanwhile we are having to rely upon our own reserve stock plus deliveries of last year's contract arrears.

"We had foreseen such a situation, and some years ago acquired a source of substitute material (barytes) which we now mine ourselves. This, however, we are unable to use owing to the endless delays, and frustration, preventing completion of the necessary plant which, partially constructed, has been standing in the open here at Stockton for the past twelve months."]

Government and Research

Aid for Smaller Undertakings

THE Government's attitude to scientific and industrial research was reflected in the House of Commons last week in answers to oral questions.

Replying to a question from Mr. F. A. Cobb (York, West Riding, Elland) as to the action being taken to bring to the notice of smaller firms the research being carried out by the Department of Scientific and Industrial Research, the Lord President of the Council (Mr. Herbert Morrison) described the use of journals, films, exhibitions and personal visits, and stated that it was one of the principal tasks of the Intelligence Department of the DSIR to ensure that these were used to the best advantage.

A suggestion was then made by Mr. Cobb that a small number of technical experts might visit factories to explain new methods to people on the spot. Such a service, Mr. Morrison replied, was already available from research associations for a small fee, and he was prepared to see a development take place on the lines suggested.

No Discrimination

This raised a question from Mr. Edgar Granville (East Suffolk, Eye), as to whether all governmental research which was available to all the large nationalised industries would also be available to the small production units.

Mr. Morrison replied emphatically that any research had always been undertaken for the benefit of industry as a whole, and that the Government would not be guilty of improper discrimination to the benefit of nationalised industries.

PARLIAMENT & SCIENTISTS

THE growing recognition of the need to apply the scientific approach to the problems of industry was referred to at the annual meeting last week of the Parliamentary and Scientific Committee, in London, by Mr. Stuart Douglas, director of the Textile Institute.

In the past, said Mr. Stuart Douglas, relations between Members of both Houses and industry had been dominated by matters affecting raw materials, labour, trade agreements, and so on. Having regard to all the other demands on Members' time, there was, no doubt, ample reason why the industrial scientist should not command so much attention in the House. It was, therefore, the responsibility of such bodies as that committee to ensure that Members of Parliament did learn of the scientist's special interests, and give some thought to them.

PERSONAL

MR. GEORGE WILLIAM RILEY, a technical director of George Scott & Sons (London), Ltd., and Ernest Scott & Co., Ltd., of Chandos House, Palmer Street, London, S.W.1, and Durie Foundry, Leven, Fifeshire, has completed 50 years' service with the firm, which he joined as a junior in the drawing office in 1899. A luncheon in his honour was given at the Connaught Rooms, London, on January 31, at which Mr. W. Lindsay Burns, chairman and managing director of George Scott & Son (London), Ltd., and managing director of Henry Balfour & Co., Ltd., the parent company, presided.

The first presentation of the Progress Medal of the Photographic Society of America was made at the society's recent 1948 convention in Cincinnati to an Englishman—Dr. C. E. KENNETH MEES, vice-president in charge of research. Dr. Mees delivered the society's first Progress Medal lecture, dealing with the work of the Kodak research laboratories.

MR. E. S. WADDINGTON, of the Industrial Department of Philips Electrical, Ltd., an active officer of the Institute of Welding, has been elected president for 1949 of the Society of Engineers (Incorporated), of which he has been a vice-president for some years.

The appointment of **MR. J. G. EVANS** as its chief chemist is announced by the Bradford Dyers' Association. **MR. EDMUND WILSON** is appointed deputy chief chemist.

MR. W. J. L. SLANN, managing director of W. J. Bush & Company, left £27,725.



Dr. H. K. Whalley, whose departure from Manchester Oil Refinery, Ltd., to join Petrocarbon, Ltd., has been announced

OBITUARY

THE death occurred at Mortimer, Berkshire, last week of **DR. JOHN PERCIVAL**, 85, Emeritus Professor of Agricultural Botany at the University of Reading, whose research and publications over a period of nearly 60 years provided most of the impetus for the establishment of the existing science of agricultural botany. Starting as a demonstrator in the Cambridge University chemical laboratories he rapidly established, at Wye College and elsewhere, his great ability to throw light on many aspects of scientific agriculture which had never been precisely stated. His "The Wheat Plant" (1921), "Agricultural Botany" (1900) and more recently, "Agricultural Bacteriology" are among the most eminent standard works of their kind.

The death has occurred, at his home in Handsworth, Birmingham, of **MR. HERBERT WATSON ROWELL**, M.I.Chem.E., an authority on plastics. He was 66. Mr. Rowell founded Ellison Insulation, Ltd. (now Tufnol, Ltd.), and was the creator of a new product in laminated plastics which was first used in the liner *Queen Mary*. He was a vice-president of the Society of Chemical Industry and had been chairman of the Birmingham section of the society, also of the local branch of the British Association of Chemists.

The death has occurred of **MR. RICHARD MAXWELL STOTHERT**, aged 78, governing director of Stothert, Ltd., manufacturing chemists, Atherton, Lancs. In 1936 he received the Order of St. John from the King for his work for the St. John Ambulance Brigade.

MR. ERNEST MALCOLM BAKER, who has died in Montreal, aged 57, was associated for many years with the chemicals group of Canadian Industries, Ltd. In 1940 he was appointed president of The McArthur Chemical Co., Ltd., at that time a subsidiary of C.I.L.

MR. DOUGLAS J. BIRDSALL, 30-year-old employee of the City Tannery, Ltd., Blackstock Street, Liverpool, who fell into a vat of acid, died in the Northern Hospital, Liverpool, on January 24. The vat contained five ft. of acid at 200°F.

W. H. A. Robertson Medal and Premium.—The first of the awards offered by W. H. A. Robertson & Company, Ltd., Bedford, and announced at the 1948 annual general meeting of the Institute of Metals, will be presented for the best paper on engineering aspects of non-ferrous metallurgy. It will be for papers published from March, 1948, to August, 1949.

Personal and Corporate Services in Industry

THE 70th anniversary of the foundation of the chemical manufacturing firm of Brotherton & Co., Ltd., Leeds, recently celebrated, has been marked by the publication of an attractive, copiously illustrated booklet. In this, the story is told of the origin and development of the organisation during its 70 years of existence, the first 50 of which will doubtless always be remembered as symbolising the life-work of its founder, Edward Allen Brotherton, first Baron Brotherton of Wakefield (1856-1930).

A Photographic Record

The many pictures include large-scale reproductions of photographs of the firm's principal plants. One shows, for example, the manufacture of ammonium bicarbonate at the Wakefield works; others illustrate the production of hexamine and sodium sulphite crystals at Wakefield. There are also a number of fine pictures of plants and manufacturing processes at the organisation's works at Leeds, Birmingham, Liverpool and Bromborough, where important groups of chemical products are made, for eventual application in a wide range of industries.

In many of the firm's manufacturing processes, it is interesting to note that the basic principles have remained the same, but with the passing of years plants have,

of course, been improved and extended, and new techniques in manufacture devised.

Among its many interesting features, this anniversary booklet describes the organisation's new central research laboratory, which was opened in Kirkstall, Leeds, in 1947. The activities here are complementary to the work of the technical staffs centred at each of the works, and play a leading part in the policy of expansion and development which is being actively pursued by the firm of Brotherton.

In a chapter headed "The Future," schemes for further extension and improvement are stated to have been prepared and to be on the way to being put into operation as rapidly as circumstances permit. In recent years, it is recalled, the Litherland Tar Works have been re-equipped with modern plant; the Birmingham works have been extended and modernised; a portion of the Wakefield works has recently been rebuilt and re-equipped, and a large modern hydrosulphite factory is in course of erection on the Bromborough site.

Working conditions in this chemical manufactory—not at any time, apparently, by any means the worst of their class—are continually being improved, and this is well illustrated by the fact that the organisation has, among its personnel, two with over 50 years and several more with over 40 years' service.



25 YEARS' EACH

Mr. S. F. Jeal, an employee of the International Chemical Co., Ltd., London, with 25 years' service, being presented with a gold watch by Mr. A. J. C. Gormley, chairman and managing director. The occasion recognised the completion of 21 or more years' service of 13 of the organisation's employees, all of whom received gold watches. The chairman also received a gold watch commemorating his own 25 years' service.

Home News Items

Export Record.—Britain has beaten all records for the export of bicycles and motor cycles. Last year, for the third in succession, more than one million bicycles were sold overseas: 1,804,878, as against 1,449,082 in 1947. Over 75,000 motor cycles were sold.

Vaults as Laboratory.—The vaults under the quadrangle in King's College, Strand, London, were badly bombed and laid bare during the war. Now the college staff is transforming them into research laboratories, particularly for biophysics, electrical and civil engineering. Before the war the vaults were used by Somerset House for storage of documents.

Lancashire Oil Drilling.—Continuing the search for the pool of oil, which for ten years has fed the pumps at Formby (Lancs.) oil wells with high-quality crude oil, The D'Arcy Exploration Co. are to start boring near the foreshore between Freshfield and Formby (Lancs.) in an endeavour to tap another source of the wells at Formby Moss, which continue to yield large quantities of fuel oil of such high average quality that experts believe that the oil must be seepage from an oilfield not yet tapped by direct line.

Textile Science.—A further step in its already extensive programme for the encouragement of the study of textile technology and science has been taken by the Textile Institute, Manchester, by its offer of a new open scholarship, worth up to £1000. Applications for this are invited both from young people already engaged in the textile industry and from those still at school who propose to study textile technology. The scholarship is intended to provide facilities for a three years' course of study in textile technology to an advanced stage and for industrial experience at home and abroad.

City Gas from Oil.—The pioneering development in Manchester of supplementing the town gas supply by the use of residual gases from the oil refining industry has just reached the productive stage. In pursuance of the agreement reached last year between the Manchester Corporation and Petrochemicals, Ltd. (THE CHEMICAL AGE, 55, 519) the Manchester Gas Department, on Thursday last week, took 140,000 cu. ft. of rich oil gas by direct pipe-line from the company's new petroleum chemicals plant at Partington into the city's adjacent gasworks, whence gas is brought to Gaythorn, in Manchester, for distribution.

Coal Production.—Although the output of deep-mined coal in Britain last week fell by 4,900 tons compared with the previous week, the total production was 7,100 tons more, due to an extra 12,000 tons from opencast operation. Comparative figures are: Last week: 4,290,100 tons (4,082,100 tons deep-mined, 208,000 tons opencast). Previous week: 4,283,000 tons (4,087,000 tons deep-mined, 196,000 tons opencast).

Scientists for 1951 Festival.—Scientists with university qualifications in one or more of the subjects of physics, chemistry, zoology, engineering, botany, agriculture, physiology and hygiene are required as assistants to the Science Director of the 1951 Festival of Britain. An announcement in *The Cambridge University Reporter*, the official university journal, states that they "will be primarily responsible for the presentation of science in the festival exhibitions and other activities and must have ability for accurately interpreting technical material in readily understandable language." Salaries range from £850 to £1200. The posts are tenable for about three years and are based in London.

HEPTALGIN VICTIM

AT an inquest last Saturday, Mr. W. Bentley Purchase, the St. Pancras (London) coroner, said that a doctor had given himself some injections of Heptalgin and that one of these injections went into an inappropriate place—a vein—and he had died as a result.

He recorded a verdict of accidental death on Robert Leslie Dods, 50, a Harley Street obstetrician and gynaecologist, who was found dying at Oxford Circus Underground station. Beside him was a hypodermic syringe and a box of drugs.

It was not implied, added the coroner, that the drug was intrinsically dangerous. "This at the best was a misuse of the drug," he said.

Dr. Hector McDonald Walker, director of research, Glaxo Laboratories, Ltd., said his firm manufactured Heptalgin, which he described as "a drug that we believe almost entirely to be useful for relief of pain." It was related to amidone and had a "very considerable" margin of safety as between a safe and a fatal dose.

Central Refinery for Western Europe?

Far Reaching Plans for Italian Oil Industry

From Our Own Correspondent

ITALY'S prospects of regaining stable industrial conditions appear to have been greatly improved by the establishment, with close collaboration of the U.S.A., of large scale oil refining operations. The first indication of this policy, supported by ERP, was the recent arrival at Bari of the U.S. tanker *Splendor* with 17,000 tons of crude oil, the first shipment of its kind from the Persian Gulf since the war.

European Depot

Other shipments of considerable volume are to follow, according to an extensive plan elaborated by Italian and American specialists and backed by the ERP administration. The ultimate goal is to develop the Italian refining industry to such a point as to turn that country into Western Europe's main storage point and producer of oil derivatives, petrol in the first place.

Not only do these ERP plans provide for a vast expansion and modernisation of Italy's already highly active refining industry; they also contemplate the building up of a considerable oil production from Italian soil itself. A team of American geologists and technical experts, members of the Western Geophysical Company, has recently arrived in Italy, in order to study local possibilities in co-operation with the Italian group, the Società Petroli Italiani. Its findings have been treated with utmost secrecy but, nevertheless, certain facts have leaked out.

It seems that oil deposits existing in the Province of Emilia have yielded an extraordinarily high benzene content—around 50 per cent, as compared to the American average of 20 per cent. This would make up for the relatively small volume of the findings made up to date. The medium depth of the deposits ascertained at Montecchio and Corniglio in Emilia is around 3000 ft., which seems to explain, at least in part, their high benzene contents.

Until now, all attempts to exploit these and other Italian oilfields have been frustrated by lack of sufficient capital and modern machinery. ERP dollars, it is thought, may now remedy this situation. More specifically, the Italian long-term reconstruction and expansion plan for the oil industry, as presented to the European ERP administration in Paris, puts the total to be invested in that field during the coming four years at \$196 million.

This amount is expected to cover the costs

of the necessary drillings to reach the Emilia deposits as well as to exploit certain strata of natural gases, the development of refining plants, and the construction of tanks and pipe lines connecting the main ports and production centres; 15 refineries will profit from ERP assistance; 11 already existing plants will expand and renew their machinery, and four refineries capable of producing 2.5 million tons of oil a year will be rebuilt.

Alpine Pipeline

Another interesting project connected with Italy's future as a main storage point of petrol in Western Europe envisages the construction of a pipeline across the Alps, into Switzerland. Through such a pipeline, petrol produced in Italy could reach the Rhine at very low transport costs, and could be shipped from there, through Western Germany, to Belgium and the Netherlands.

The Italian Government hopes to be able to raise the funds necessary for the realisation of this project outside of the ERP programme, by floating a private loan in Switzerland and thus obtaining a considerable amount of hard Swiss currency.

FRANCE NEEDS PHOSPHORUS

THE service yielded by phosphorus and phosphoric acid in agriculture, human and animal life was discussed during three study days at the Maison de Chimie in Paris. The present phosphorus shortage in France was stated to threaten the gravest consequences. French consumption of phosphoric acid, compared with 1938, fell by 73 per cent in 1942 and in 1944-5 was only 6 per cent of consumption in 1938-9. Lack of phosphorus manures has led to a progressive reduction in agricultural output and to hematuria, tuberculosis and enteritis in animals, as well as lowering reproduction. In human beings the result has been a tendency to double fractures, malformations in children, and an extension of tuberculosis.

Supplies of phosphates for Europe are assured by North Africa, which produces 6 million tons annually, but the French share, decided by international agreement, is just over 10 per cent. The manufacture of phosphorus requires larger quantities of coal and electric power than France can at present provide.

Overseas News Items

Austrian-Jugoslav Barter.—A barter arrangement has last month been concluded between Austria and Yugoslavia according to which the former will send high grade steel and iron wire valued at \$1.120 million, while she will obtain sleepers for the Austrian railways, ferro-chrome, and timber for match manufacture.

Swiss Chemical Exports.—Exports of Swiss chemical and pharmaceutical products reached a new high level in December, with a value of 64.2 million Swiss francs against 47.7 million in November. In particular, exports of dyestuffs leapt from 23.1 million to 31.7 million, and there was also a noteworthy increase in shipments of pharmaceutical products from 15.1 to 21.8 million. Industrial chemicals rose only slightly from 0.2 to 7.9 million, and perfumery increased from 1.8 to 2.8 million Swiss francs.

New Synthetic Fibre.—Tests to discover new uses for a synthetic polyvinyl fibre manufactured at a rate of 200 kg. a day are now being carried out by Japan's Kurashi Rayon Company. Polyvinyl acetate and alcoholic caustic soda are employed and the solution is treated in a bath of zinc and sodium sulphate. The fibre is insolubilised by acetylation in the presence of formaldehyde, sulphuric acid, and sodium sulphate. The new fibre, which will resemble wool, will resist acids, alkalis and oils, and is said to have excellent mechanical properties.

French Chemical Industry.—The 24-year-old firm of Etablissements Kuhlmann, which before the war operated 25 factories, has played a large part in the post-war recovery of the French chemical industry. Latest figures to hand show a production by this firm of sulphuric acid in 1947 of 1,069,356 tons, notwithstanding the closing of the Spanish frontier which stopped imports of pyrites. The 1947 production of copper sulphate was 76,000 tons, which is reported to have covered all domestic needs. The output of superphosphates in 1947 was 1.5 million tons.

Spirit Production in France.—Steps to increase national spirit production are being taken by the French government. Distillers are to declare their stocks of molasses, and 50 per cent of the alcohol extracted from molasses and grain between July 1, 1948, and June 30, 1949, is to be taken over by the State for use as a form of carburant, after mixing with petrol. Six pilot-plants for the distillation of wood, and one for the distillation of molasses are to be reconstructed by the National Vegetable Oil Department.

Marine Algae Products.—Research in Chili has shown favourable conditions for treating locally, marine algae on a large scale. Many varieties exist, containing 20 per cent polysaccharides, which are suitable for the extraction of agar, production of which is limited to the U.S.A., Japan and Ceylon. Other giant algae, which are very common and easy to collect, contain up to 60 per cent alginic acid. Different algae would enable the easy extraction of laminarine, which by hydrolysis, would supply glucose, and of carragenin, which is used for food, cosmetics, etc.

S.C.I. IN DUBLIN

THE Dublin and District section of the Society of Chemical Industry, has been formed at a meeting in Trinity College, Dublin.

Its aims, like those of the many other existing sections, are to provide a medium which will enable manufacturers and technicians to hear papers and discussions of a non-academic nature on the various scientific problems connected with industry. It will also procure an exchange of technical data and information with the British, American and Australian sections. As owing to the wide field of activity which it covers, a very great deal of applied technical information will be made available to its members, the executive committee has been selected from representatives of a very wide range of manufacturers, as well as representatives from the universities. Mr. T. W. Breaden is the section's first honorary secretary.

There were in Ireland 50 individual members of the society before the Dublin and district section was formed.

TO CEASE SOAPMAKING

THE established soap manufacturing firm of Ogston & Tennant, Ltd., of Renfrew, Scotland, is to discontinue soap production there in June this year. The plant will then be developed for the production of agricultural feeding stuffs. Ogston & Tennant, Ltd., is associated with the British Oil and Cake Mills, Ltd., organisation, which is in need of space in which to develop production.

The works at Renfrew have the advantage of proximity to the Clyde and to the network of distributive organisations linked to the river and Glasgow, and to the South West Scotland dairy and agricultural area.

Next Week's Events

MONDAY, FEBRUARY 7

Society of Chemical Industry (Food Group) London: Grosvenor House, Park Lane, W.1, 7.0 p.m. First annual dinner-dance.

Textile Institute Manchester: 16 St. Mary's Parsonage, 7.15 p.m. Joint meeting with Society of Dyers and Colourists and S.C.I. Dr. E. S. Paice: "Detergents."

Sir John Cass Technical Institute (Department of Chemistry) London: Jewry Street, Aldgate, 6.30 p.m. N. W. Roberts: "Thermodynamics for Chemical Engineers" (No. 4).

TUESDAY, FEBRUARY 8

Institution of Chemical Engineers London: Geological Society, Burlington House, W.1, 5.30 p.m. Discussion on Welded Pressure Vessel Code.

Royal Institute of Chemistry (Edinburgh and East of Scotland Section) Edinburgh: Joint meeting with University Chemical Society, 7.30 p.m. R. D. Haworth: "Some Recent Advances in the Chemistry of Natural Products."

Institute of Metals (South Wales Local Section). Swansea: University College, 6.30 p.m. G. L. Evans: "A Visit to Africa."

Sir John Cass Technical Institute (Department of Chemistry) London: Jewry Street, Aldgate, 6.0 p.m. Prof. H. S. W. Massey: "Atomic Nuclei—No. 2."

WEDNESDAY, FEBRUARY 9

Institute of Fuel Manchester: Engineers' Club, 6.30 p.m. R. F. W. Guy: "Developments in the Design of Automatic Stokers for Shell Type Boilers."

Society of Instrument Technology Manchester: College of Technology, 7.30 p.m. C. A. Whitmarsh: "Introduction to the Measurement of Radioactivity in a Factory."

Society of Dyers and Colourists (Northern Ireland Section). Belfast: 7.30 p.m. Dr. T. Vickerstaff: "A Study of the Factors Controlling Dyeing Behaviour."

THURSDAY, FEBRUARY 10

The Chemical Society Bristol: University, 7.0 p.m. Dr. A. S. C. Lawrence: "The Stability of Emulsions." Liverpool: University, 4.30 p.m. Dr. G. Gee lecture.

Society of Dyers and Colourists (Midlands Section). Derby: Midland Hotel, 7.0 p.m. Dr. L. P. Moore: "Some New American Fibres."

Institution of Works Managers, Ltd. Wembley. Rest Hotel, Kenton, 12.30 p.m. B. J. A. Bard: "Research and the Small Company."

Institute of Metals London: 4 Grosvenor Gardens, S.W.1, 7.0 p.m. T. P. Hoar: "Metallic Corrosion."

Society of Chemical Industry Nottingham: Technical College, 7.15 p.m. Joint meeting with R.I.C. Miss A. P. Wilson: "Symposium on Plant Diseases."

Sir John Cass Technical Institute (Department of Chemistry) London: Jewry Street, Aldgate, 6.0 p.m. David W. Wilson: "Microchemical Analysis." (No. 4).

The Royal Society London: Burlington House, W.1, 4.30 p.m. C. H. Bamford and M. J. S. Dewar: "Studies in Polymerisation III"; H. W. Melville and J. C. Robb: "The Kinetics of the Interaction of Atomic Hydrogen with Olefines, I, II, III and IV."

FRIDAY, FEBRUARY 11

The Chemical Society (Newcastle and Durham) Newcastle-on-Tyne: King's College, 5.0 p.m. Bedson Club Lecture. Dr. A. J. Martin: "Partition Chromatography."

Oil and Colour Chemists' Association Manchester: Engineers' Club, 2.0 p.m. S. G. Tinsley and Dr. A. Bowman: "Rutile Type Titanium Pigments."

Chartered Institute of Secretaries Swansea: J. B. H. Drewett: "The Significance of Working Party Reports."

Sir John Cass Technical Institute (Department of Chemistry) London: Jewry Street, Aldgate, 6.30 p.m. "Unit Operations in Chemical Engineering—No. 3." J. M. Coulson: "Evaporation."

SATURDAY, FEBRUARY 12

Institution of Chemical Engineers (North West Branch) Liverpool: Joint meeting with Liverpool section, S.C.I. C. H. G. Hands and W. S. Norman: "Developments in the Use of Climbing Film Stills for the Distillation of Heat Sensitive Materials."

British Interplanetary Society London: St. Martin's School, Charing Cross Road, W.C.2, 6.0 p.m. J. Humphries: "The Design of Liquid-propellant Rocket Motors."

International Welding Institute

The 1949 annual meeting of the International Institute of Welding will be held in the University buildings at Delft, Holland, from May 16 to 19.

The International Institute was founded last June to promote the development of welding by all processes. Its members include welding societies and institutes in eleven countries of Western Europe, North America, South Africa and New Zealand.

The meeting will be the first of the regular meetings of the institute and the first meeting of the specialist commissions, at which technical problems will be discussed.

South African Chemicals

New £5 m. Oil Refinery

THE Union Petroleum Refinery (Pty.), Ltd., with registered offices in Johannesburg, has completed provisional plans for the construction of a £5 million oil refinery at the coast, to produce petrol and lubrication oil. The enterprise will be the first of its kind in the Union. It is estimated that 50 per cent will be saved on overseas expenditure by importing crude oil instead of the refined product.

* * *

Total capital expenditure on development undertaken and projected by African Explosives and Chemical Industries exceeds £6 million, states a circular issued by De Beers Investment Corporation, which holds half the ordinary share capital of African Explosives.

* * *

Marine Oil Refiners of Africa, Ltd., Dido Valley, Simonstown, Cape Peninsula, is now in active production at a factory built on a 10-acre site. The concentrating unit is operated on the American Soloxol process. It is claimed that this is the first plant of its kind in the world to go into production.

* * *

More than 50 tons of benzene hexachloride bait powder and 20 tons of BHC wettable powder for spraying have been sent from the national chemical factory at Klipfontein to the areas in the Karoo where locusts are hatching from eggs laid during the last "invasion." The locust bait is mixed with the BHC powder and is used for the control of locusts in the "voetganger" or hopper stage. These hopper swarms are also sprayed with a water suspension of the 40 per cent wettable powder and the same spray is used against those which reach the adult stage. Spraying operations and baiting are now in full swing. The heaviest demands ever experienced for agricultural and general DDT and BHC insecticides are now being met from the national factory.

* * *

The Rely Metal and Paint Works, of Cape Town, which is producing synthetic paints in 22 different shades, reports that it is experiencing difficulty in obtaining sufficient young men for training in this promising and specialised industry.

French Chemical Capital Increased.—The Manufactures Chimiques du Nord, Etablissements Kuhlmann, one of the leading French chemical companies, has recently decided to increase its share capital from 1098 to 2196 million francs. A further increase of capital to 4 milliard francs has also been authorised.

Canadian Plastics

Phenomenal Post-War Development

THE plastics industry in Canada last year continued its steady rise, holding its pace as the fastest-growing business in the Dominion. Figures compiled in Toronto indicate an investment of about \$43 million in the industry in Canada at the end of 1948. This represents an increase of about \$12 million during the year.

The industry's payroll in 1948 is expected to be \$20.25 million, compared with \$18.5 million in 1947, and that there were 15,100 employees as against 12,000. The total sales last year, excluding plastics components, is estimated at \$62.3 million, compared with \$51 million in 1947. Export of Canadian plastics during the year is estimated at \$8 million, an increase of more than £2 million since 1947. Raw materials purchased for plastics last year were valued at \$24 million and 66 per cent of them were Canadian. During 1949, it is expected, these purchases will total about \$31 million.

Preserving Quality

Mr. V. G. Bartram, president of Canadian Resins and Chemicals, Ltd., observes that plastic materials have now won public acceptance as the rising sales indicate. The industry is taking care that this public approval is not diminished by wrong use or depreciation of quality of plastics. Last year the industry set up a committee to promote informative labelling on plastic products so that buyers of plastic materials or finished products will know exact properties and limitations. A great variety of new consumer products appeared on the market during 1948, and many new industrial uses have been developed in recent months. Plastic linings are about to be used in pipes as protection against corrosive and abrasive materials. In the motor industry, plastics are being used for door locks and knobs, pedal pads, insulation and a variety of other uses. In the building trades, vinyl insulation for wiring is rapidly becoming general practice. Increasingly, goods such as furniture, floor coverings, footwear, radio cabinets and clock cases are being produced in plastic materials and are gaining in popularity.

Record for Malayan Tin

A fifty years' record was broken by the Malayan tin industry last year when tin valued at 194 million dollars was exported, the highest figure attained since 1898, which exceeded 1947 by more than 100 million dollars. Exports reached 45,018 tons of tin metal or 18,638 tons more than 1947.

Commercial Intelligence

The following are taken from the printed reports, but we cannot be responsible for errors that may occur.

Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described herein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

CHEMO-PLASTICS, LTD., London, E.C. (M., 5/2/49.) December 21, debenture to H. Presman, London; general charge. *£3,240. October 28, 1947.

CROWN CHEMICAL CO., LTD., Lamberhurst. (M., 5/2/49.) December 14, £3300 mortgage to National Provincial Bank, Ltd.; charged in Stair House, Lamberhurst, and block of flats near thereto, also land formerly part of Court Lodge, Lamberhurst. *Nil. August 22, 1947.

PORTSLADE BY-PRODUCT CO., LTD., Shoreham-by-sea. (M., 5/2/49.) December 14, £3600 debenture; general charge. *£1100. March 23, 1948.

TUNGSTEN MANUFACTURING CO., LTD., London, S.W. (M., 5/2/49.) December 21, mortgage to Halifax Building Society, securing £10,000 and further advances; charged on 112a Junction Road, 27 Tremlett Grange and 22 Poynings Road, Islington. *£16,500. October 6, 1948.

Satisfactions

BRITISH DRUG HOUSES, LTD., London, N. (M.S., 5/2/49.) Satisfaction December 20, of charge registered January 6, 1948.

FREDERICK GODFREY, WHOLESALE, LTD., Matlock Bath. (M.S., 5/2/49.) Satisfaction December 24, £2000, registered March 10, 1939.

HARMAN DIETETIC LABORATORIES, LTD., Burnt Oak. (M.S., 5/2/49.) Satisfaction December 16, £3000, registered May 20, 1947.

W. H. HOLLAND & CO., LTD., Bolton. (M.S., 5/2/49.) Satisfaction December 20, of mortgage registered March 4, 1941.

Company News

The following increases in registered capital are announced: **British Petroleum Chemicals, Ltd.**, from £100 to £5 million; **George Priestley & Sons, Ltd.**, from £10,000 to £35,000; **Sanderstead Chemicals, Ltd.**, from £100,000 to £110,000; **Standardised Disinfectants Co., Ltd.**, from £1000 to £2000.

New Companies Registered

Nappi-White, Ltd. (462,603). Private company. Capital £500. Manufacturers of chemicals, gases, drugs, etc. Reg. office: 17 Conduit Street, W.1.

Norton & Riding (Yorks), Ltd. (463,500). Private company. Capital £500. Chemical and general plumbers, glazing contractors, lead burners, engineers, etc. Directors: J. E. Riding and S. Norton. Reg. office: 24 Seal Street, Manningham, Bradford.

Odaban, Ltd. (462,337). Private company. Capital £500. Manufacturers of patent articles, chemical products, fertilising substances, etc. Directors: F. A. Instone, R. F. Lancaster. Reg. office: College Hill Chambers, Cloak Lane, E.C.4.

Reptex, Ltd. (462,345). Private company. Capital £1000. Manufacturers of glues, adhesives, chemicals, etc. Directors: W. G. Hitchins, A. Kennedy-Wilson. Reg. office: 51-7 High Street South, East Ham, E.6.

Shell Chemicals Distributing Co. (Middle East), Ltd. (462,733). Private company. Capital £10,000. Solicitors: Waltons & Co., 101 Leadenhall Street, E.C.

Shell Chemicals Distributing Co. of Egypt, Ltd. (462,734). Private company. Capital £10,000. Solicitors: Waltons & Co., 101 Leadenhall Street, E.C.

Tricana, Ltd. (462,904). Private company. Capital £100. Manufacturers of chemical substances, including detergents, relating to the distilling and refining of oils, etc. Solicitors: Holmes Son & Pott, 301 Salisbury House, E.C.2.

Chemical and Allied Stocks and Shares

THE renewed strength of British Funds has been outstanding in stock markets, which generally have been firm, notwithstanding fears of dividend limitation for another year. British Funds derived strength from the view that the £200 million of British Gas stock (to be issued on May 1) will prove to be a 3 per cent stock and longer-dated than existing nationalisation stocks. In response to this assumption, "irredeemable" stocks, notably 2½ per cent Consols and 2½ per cent Treasury Bonds, showed further gains, and 3 per cent Transports also participated well in the upward movement.

Chemical and kindred shares were generally subdued, buyers again showing caution owing to the view that a Labour success at the next General Election would be followed by a bid to nationalise the

chemical industry. Imperial Chemical have moved down to 47s. 6d., but this was due partly to attention drawn to the company's big capital commitments owing to steady expansion at home and overseas. The question of German competition in the future was also a factor influencing markets. In conjunction with Courtaulds, I.C.I. is to take up £2 million new shares in British Nylon Spinners, in which they are both joint partners.

Monsanto 5s. Ordinary have been steady at 62s. 6d. with Fisons again around 59s., Laporte 5s. Ordinary 21s. 3d., Burt Boulton 28s. 9d., Amber Chemical 2s. shares 9s. 6d., Albright & Wilson 31s. and William Blythe 2s. shares again changed hands over 20s. in anticipation of good financial results. Borax Consolidated were 63s. 9d., British Aluminium have further strengthened to 51s. 6d. and British Glues & Chemicals 4s. shares rose further to 22s. 9d. British Drug Houses 5s. shares at 9s. 3d. were also higher. Elsewhere, however, the 4s. units of the Distillers Co. eased to 29s. 1½d., United Molasses to 50s. 6d. and Dunlop Rubber at 76s. 6d. failed to hold best levels. Glaxo Laboratories fluctuated, but after a small decline, moved up to £23.

Rather more attention centred on shares of companies with plastics interests, Klee-mann improving to 25s., while De La Rue were 40s. British Industrial Plastics 2s. shares 7s., and J. B. Broadley 15s. 3d. British Xylonite, however, fell back to £5½. In other directions, British Oxygen firmed up to £5½. Barry & Staines were 55s. 9d. and Nairn & Greenwich 77s. 6d. Turner & Newall, after easing, were firmer at 85s. 3d.

Iron and steels were little changed and unaffected by the higher profits which continue to be shown by financial results owing to the expansion in steel output. Hadfields at 31s. 7½d. strengthened on the past year's results, Staveley were firmer at 89s. 7½d., as were United Steel at 30s. 4½d. Elsewhere, General Refractories 10s. shares remained at slightly over 23s. Amalgamated Metal were 20s. 7½d. and Pinchin Johnson easier at 52s., but Goodlass Wall 10s. Ordinary remained at 39s. in anticipation of good financial results.

Boots Drug eased to 56s. 9d., Sangers were 34s. 9d., Beechams deferred 17s. 10½d. and Griffiths Hughes 29s. 1½d. British Match shares (35s. 3d.) have been steady. Triplex Glass 10s. Ordinary kept around 23s. 9d. and Tube Investments at £6½ remained active. According to some market views, the £1 shares of the latter may be "split" into 5s. units later in the year. Stewarts & Lloyds were 57s. 9d. Oils showed small irregular movements, Shell easing to

75s. 7½d. and Burmah Oil to 68s. 9d., but Anglo-Egyptian at 82s. 6d. rose further on the latest oil discoveries, and Ultramar Oil (32s. 6d.) were better following the latest production figures. Anglo-Iranian were helped by the news from the Middle East, but eased slightly after reaching £9½.

British Chemical Prices

Market Reports

FIRM price conditions are reported from all sections of the industrial chemical market and buying interest during the past week has been fairly widespread, both on home account and for shipment. Delivery specifications, too, have covered good volumes. Among the soda products, sulphide of soda is in steady call, while offers of yellow prussiate, chlorate and bichromate of soda are finding a ready outlet. Quotations for soda metasilicate are reported to be slightly lower. With the demand greater than the quantities available for delivery, the potash chemicals continue strong. There have been no special features in other sections of the market, and apart from a brisk demand for pitch the coal-tar products market is quiet and steady.

MANCHESTER.—Trading conditions on the Manchester chemical market during the past week have been described as satisfactory from the point of view of the actual movement into consumption and of the volume of new business that has been placed. Soda ash, caustic soda and other alkali products are being called for in good quantities, and there has been a steady inquiry also for a wide range of other heavy products. A satisfactory trade is passing also in many of the light chemicals. Demand for the fertiliser materials as a whole is fairly active, and a ready outlet is being found for both the light and heavy tar products.

GLASGOW.—There has latterly been little noteworthy activity in the Scottish chemical market. The volume of business transacted in industrial chemicals has been about average for the time of the year, sales always being on a reduced scale in January. It has been noted that, the supply position having eased, a definite tendency to reduce prices has begun. The sale of pharmaceutical chemicals is also quiet, particularly of those materials on which there is Purchase Tax. There is apparently a general feeling among druggists that there will be changes in Purchase Tax in April, and they are therefore reducing stocks. The export market has been considerably more active, with a particularly heavy demand for Glauber salts. A number of satisfactory orders have been booked.

Patent Processes in Chemical Industry

The following information is prepared from the Official Patents Journal. Printed copies of specifications accepted will be obtainable, as soon as printing arrangements permit, from the Patent Office, Southampton Buildings, London, W.C.2, at 2s. each. Higher priced photostat copies are generally available.

Complete Specifications Accepted

- Molten metal containers.—H. J. Daussan. Nov. 5, 1943. 613,822.
- Production of pyridine derivatives.—Merck & Co., Inc. July 14, 1944. 613,824.
- Process of manufacture of hexachloride and products obtained by this process.—A. P. H. Dupire. Oct. 1, 1942. 613,519.
- Manufacture of vinyl esters or ethers and their homologues.—N. V. Gevaert Photo-Producten. Aug. 10, 1943. 613,934.
- Fatty acid esters having amphoteric properties.—J. W. Orelup. Sept. 13, 1945. 613,835.
- Manufacture of vat dyestuffs.—Ciba, Ltd. Sept. 25, 1944. (Cognate Application 24688/45.) 613,836.
- Penicillin-containing therapeutic compositions and the preparation and use thereof.—American Cynamid Co. Sept. 22, 1945. 613,524.
- Electro-recovery of metals.—National Lead Co. Jan. 13, 1945. 613,841.
- Light-weight compound sheet materials.—Libbey-Owens-Ford Glass Co. Dec. 16, 1944. 613,529.
- Manufacture of water-dispersible chemical products capable of imparting hydrophobic properties to textile fibres.—Montclair Research Corporation. Feb. 16, 1945. 613,850.
- Production of organic nitro compounds.—Imperial Chemical Industries, Ltd., and C. W. Scaife. Jan. 14, 1946. 613,853.
- Recovery of light oil from absorbent.—Koppers Co., Inc. Dec. 24, 1941. 613,533.
- Removal of ultimate moisture from powdered products.—Borden Co. June 2, 1945. 613,548.
- Production of resinous materials.—Distillers Co., Ltd., and L. Dennis. June 6, 1946. (Cognate Application 26574/46.) 613,878.
- Polymerisation in the presence of copper or a copper alloy.—British Thomson-Houston Co., Ltd. June 13, 1945. 613,880.
- Rickert. June 17, 1946. 613,568.
- Methods and plants for the efficient extraction of the active constituents in barks, aromatic vegetables and like organic substance.—J. Heller. June 17, 1946. 613,562.
- Halogenated hydrocarbon compositions.—British Thomson-Houston Co., Ltd. June 18, 1945. 613,566.
- Rotary extraction, drying or like apparatus for treating, in particular, granular, flocculent or pulverulent materials.—E. Rickert. June 17, 1946. 613,565.
- Method for uniform dyeing of cellulose acetate.—Textron, Inc. June 23, 1945. 613,588.
- Production of ferrochrome.—W. B. Hamilton. June 20, 1946. 613,591.
- Inductor for induction heating apparatus.—Induction Heating Corporation. June 27, 1945. 613,618.
- Production of articles from multi-coloured plastic materials by extrusion.—J. Delorme. June 23, 1945. 613,635.
- Manufacture of organic silicon compounds.—Imperial Chemical Industries, Ltd., A. Bowman, E. M. Evans, J. R. Myles, and L. C. Payman. June 24, 1946. 613,648.
- Stabilisation of halogenated hydrocarbons.—British Thomson-Houston Co., Ltd. June 26, 1945. 613,649.
- Removal of sulphur compounds from gases.—L. J. Derham, and F. J. Johnson. June 24, 1946. (Cognate Application 28715/46.) 613,651.
- Apparatus for treating crops with liquids, dusts, gases or vapours.—Pest Control, Ltd., W. E. Ripper, A. K. Dorman, and F. R. Norman. June 24, 1946. 613,657.
- Process for the manufacture of allyl-(1-methylbutyl)-thiobarbituric acid.—A. Abbey (E. Lilley and Co.). June 25, 1946. 613,704.
- Process of preparing substituted thiobarbituric acid.—A. Abbey (E. Lilley and Co.). June 25, 1946. 613,705.
- Lithium base lubricating greases.—Anglo-Saxon Petroleum Co., Ltd., and J. A. Bell. June 26, 1946. 613,706.
- Process for isomerising mono-olefinic hydrocarbons.—Universal Oil Products Co. Aug. 19, 1943. 613,684.
- Containers for hydrogen peroxide.—B. Laporte, Ltd., W. S. Wood, J. Harnaman, and C. O. Bishop. June 26, 1946. 613,689.
- Solutions of cellulose ethers and products made therefrom.—British Celanese, Ltd. June 28, 1945. 613,690.
- Refining of lead.—Soc. Minière et Metallurgique de Penarroya. May 7, 1946. 613,714.
- Manufacturing of tetrasubstituted ethylene-diamines.—R. M. Hughes (J. R. Geigy Akt.-Ges.). June 27, 1946. 613,696.
- Method for freshening air and composition therefor.—Airkem, Inc. June 28, 1945. 613,699.
- Bonding rubberlike materials to metal.—United States Rubber Co. Aug. 24, 1945. 613,701.

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SITUATIONS VACANT

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AN expanding Middle East Oil Company urgently requires an Assistant Engineer to work initially in the London Office and be willing to accept transfer to the Persian Gulf after one year. Should possess B.Sc. Degree in Chemical or Mechanical Engineering. Will be required to assist in duties involving loading and bunkering facilities, oil gas distribution, and other oil control duties. Some experience of these duties essential. Experience in oil bunkers control with docks' operating group of the Royal Engineers may be advantageous. Age 25-30. Salary starting £600-£700 per annum according to age and experience. Write, giving brief details, for application form, and quoting LO 133, to Box "P.Y." c/o J. W. VICKERS & CO., LTD., 7/8, Great Winchester Street, London, E.C.2.

CHEMICALS, Drugs, Waxes: Energetic Representative required for the Northern Counties by old established firm of Importers. Permanent position. Good remuneration. Apply in confidence, giving details of experience, to Box No. 2766, THE CHEMICAL AGE, 154, Fleet Street, London, E.C.4.

CHEMIST required in metallurgical laboratory in North London to undertake assaying in base metals, ores, concentrates and residues, including tungsten. Give full details, experience and salary required. Box No. 2765, THE CHEMICAL AGE, 154, Fleet Street, London, E.C.4.

CHEMIST with good degree and preferably two to three years industrial experience wanted for research in oils and fats for London chemical plant manufacturers. Salary according to qualifications and experience. Box No. 2764, THE CHEMICAL AGE, 154, Fleet Street, London, E.C.4.

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SENIOR Draughtsman required for chemical works. Applicant should be 30 to 40 years of age, having a high standard of drawing skill and experience of chemical works, and be capable of collaboration with technical staff for the design and layout of new chemical plants. Applicants should state age, full details of training and experience, and salary required, to **WORKS MANAGER, John Nicholson & Sons, Ltd., Hunslet Chemical Works, Leeds, 10.** (By permission of the Ministry of Labour and National Service, under the Control of Engagement Orders, 1947 and 1948.)

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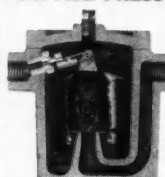
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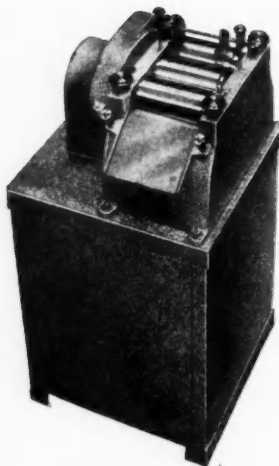
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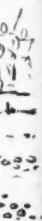
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